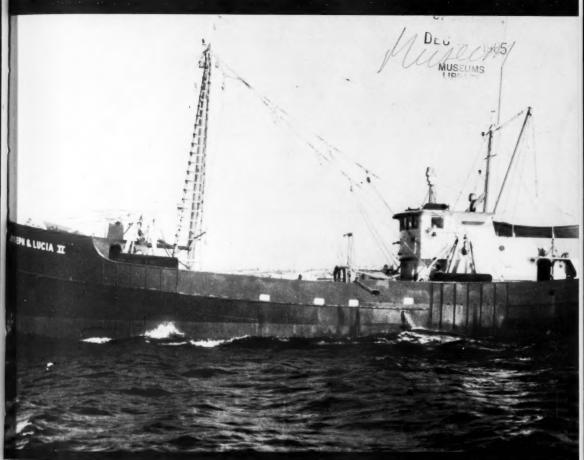
COMMERCIAL DEVIEW



VOL. 27, NO. 11

NOVEMBER 1965

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Fish and Wildlife Service

Bureau of Commercial Fisheries

Washington, D.C.

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UNITED STATES DEPARTMENT OF THE INTERIOR

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A review of developments and news of the fishery industries prepared in the BUREAU OF COMMERCIAL FISHERIES.

> Joseph Pileggi, Editor G. A. Albano and H. Beasley, Assistant Editors

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5/31/68

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COVER: loseph & Lucia II, a new steel trawler operating out of Gloucester, Mass., is equipped with a number of safety features: (1) an 8-man inflatable liferaft; (2) skid-resistant surface on deck and on main winch platform; (3) guard rails on deck bollards; (4) forecastle escape hatch; (5) pneumatic controls on trawl winch; (6) level winder for trawl wire; and (7) pilothouse controls for main engine.

Those are some of the leading safety features recommended for medium or large otter-trawl vessels.

The 96-foot vessel, built early in 1965 by a shipyard in Somenset, Mass., is powered by a 680-horse-power diesel engine.

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PACIFIC COAST WHALE-MARKING PROGRAM

Data collected by the U.S. Bureau of Commercial Fisheries during the 1964/65 whale-marking program off the Pacific Coast was in the process of being analyzed earlier this year by scientists of the Bureau's Tuna Resources Laboratory, La Jolla, Calif. The whale-marking program is conducted annually between December and March by the Bureau.

Bureau biologists "mark" the whales by firing a 10-inch projectile of stainless steel tubing into the thickest part of the blubber. The numbered projectile is harmless to the whale and provides much valuable information if the marine mammal is caught by whalers. The whale-marking program has permitted scintists to study many factors in the life cycle of various whale species, including population, migration, longevity, and mortality.

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OFF THE MOUTH OF THE COLUMBIA RIVER

By Hiromu Heyamoto* and Miles S. Alton*

ABSTRACT

Sablefish were taken at depths of 50 to 650 fathoms during Bureau of Commercial Fisheries-Atomic Energy Commission trawling surveys off the Columbia River, Oreg. The surveys, which began in June 1961, were conducted on a seasonal basis at stations located at 25-fathom depth intervals from 50 to 500 fathoms, and at seven additional stations located at varying depths from 600 to 1,050 fathoms. Sablefish catches were generally greater at depths from 200 to 450 fathoms than from any other depth. Catches ranged from 400 to 2,100 pounds per hour trawled. The sizes of sablefish taken ranged from 10 to 37 inches. The mean size of sablefish increased as the depth increased.

Sablefish in a spawning condition were encountered in March.

Data from these cruises and recent data from the Japanese gill-net fishery and exploratory cruises of the $\underline{\text{John N}}$. $\underline{\text{Cobb}}$ indicate that a large population (or populations) of sablefish occurs in 200 to 400 fathoms of water off the coasts of Oregon, Washington, and in the Gulf of Alaska.

INTRODUCTION

In the years subsequent to World War II there has been increasing evidence collected by scientists (Alverson, et al. 1964, Isaacs 1960, Pneumo-Dynamics Corporation 1961) that sablefish (fig. 1) are perhaps more abundant in deep water (below 200 fathoms) than had been previously anticipated. The initial success demonstrated by Japanese fishing operations along

the continental slope in the eastern Bering Sea and Gulf of Alaska have tended to confirm the availability of sablefish in deep water. It has been suggested that the greatest abundance of the species may occur at depths generally beyond the range that they are exploited by North American long-line and trawl vessels.

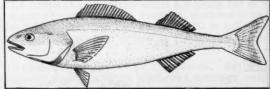


Fig. 1 - Sablefish, Anoplopoma fimbria.

In June 1961 the U. S. Bureau of Commercial Fisheries, in cooperation with the Atomic Energy Commission (A.E.C.), initiated a study of the marine fauna in the area southwest of the mouth of the Columbia River. Although the cooperative Bureau-A.E.C. project had many objectives, one important aspect of the investigation was assessing on a time basis the abundance and distribution of bottom fish and invertebrates inhabiting the Outer Continental Shelf and slope. An additional objective of the study was to ascertain whether fish were sufficiently abundant in deep water (depths of greater than 200 fathoms) that they might in the future support commercial fish operations.

Data from this investigation, collected from June 1961 through November 1963, have been assessed to provide more detailed information concerning the bathymetric distribution and relative abundance of sablefish on the continental slope and shelf.

*Fishery Biologists (General), Exploratory Fishing and Gear Research Base, U. S. Bureau of Commercial Fisheries, Seattle, Wash.

U. S. DEPARTMENT OF THE INTERIOR Fish and Wildlife Service Sep. No. 744

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METHODS AND GEAR

In order to obtain information on the community of demersal fish inhabiting the waters adjacent to the Columbia River, a trackline was established southwest of the Columbia River lightship at depths between 50 and 1,050 fathoms. During the initial cruise, June 1961, trawl stations were established at 25-fathom intervals at depths from 50 to 450 fathoms. In subsequent cruises deeper stations were established at depths of 475, 500, 600, 650, 750, 850, 900, and 1,050 fathoms. Geographic locations of those stations are given in table 1. The shallowest

Table 1 - Positions of Bureau of Commercial Fisheries-Atomic Energy Commission Trawling Stations off the Columbia River, Oreg.

Station Depth Position Station Depth Position Designation (Fathoms) N. Lat. W. Long. Designation (Fathoms) N. Lat. W. Long.

1A 50 46°08.2! 124°12.3! 14A 375 45°56.7! 124°10.10

Designation	(Fathoms)	N. Lat.	W. Long.	Designation	(Fathoms)	N. Lat.	W. Long.
1A	50	46008.21	124012.31	14A	375	45°56.71	124051.01
2A	75	46007.41	124°31.61	15A	400	45053.61	124052.61
3A	100	46003.41	124°39.4"	16A	425	45059.21	124052.11
4A	125	46002.21	124043.11	17A	450	45°54.11	124°55.51
5A	150	46002.8	124043.8	18A	475	45052.21	124052.51
6A	175	45°59.61	124044.1	19A	500	46002.71	124057.31
7A	200	46°00.31	124045.41	23A	600	45044.51	124053,91
8A	225	45°58.21	124°45.01	25A	650	45°44.31	124°54.01
9A	250	45058.21	124046.21	29A	750	45°36.31	124°53.71
10A	275	45059.91	124049.11	31A	800	46°01.8	125004.51
11A	300	45°57.51	124048.81	33A	850	45054.0	125°08, 81
12A	325	45°58.01	124°50.31	35A	900	45050.01	125010.61
13A	350	45056.01	124049.51	41A	1,050	45°42.21	125°13.01

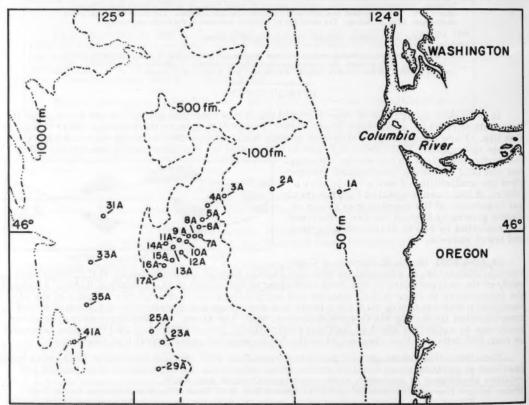


Fig. 2 - Bureau of Commercial Fisheries-Atomic Energy Commission trawling stations off the mouth of the Columbia River.

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station (50 fathoms) is located approximately 5 miles southwest of the Columbia River lightship, and other stations are found along a trackline extending in the same general direction to the 1,050-fathom depth contour (fig. 2).

Stations have been frequented approximately four times each year. As originally intended, it was hoped that all stations could be occupied once during each cruise. However, bad weather frequently hampered deep-water operations. Thus, the stations at depths between 50 and 450 fathoms received major emphasis, while stations at greater depths were only occasionally sampled.

The trawl surveys were conducted from aboard the 93-foot Bureau of Commercial Fisheries' exploratory fishing vessel John N. Cobb and from aboard the 68-foot M/V Commando which was chartered from the University of Washington. Both vessels were rigged with standard trawl gear and 1,000 fathoms of cable on each of two drums, which enabled fishing to be conducted to depths of 1,050 fathoms.

Duration of drags made at the 50- and 75-fathom stations was one-half hour, while at greater depths the nets were normally towed for one hour.

Standard 400-mesh eastern commercial otter trawl nets were used to sample the bottom fauna from 50 to 450 fathoms. A western trawl was used during part of the winter cruise in 1962 but was subsequently replaced with an eastern trawl. Since the trawls were constructed of $3\frac{1}{2}$ -inch webbing, a $1\frac{1}{2}$ -inch mesh liner was placed in the cod end to retain small fish and invertebrates. Commercial aluminum alloy 8-inch diameter floats were used on the headrope of the trawls.

Gulf of Mexico shrimp trawls were used to sample stations at 500-fathom depths and greater. A 43-foot shrimp trawl was used during the initial surveys but was replaced with a 72-foot semiballoon trawl, when it was found that the latter could be operated satisfactorily in deep water. Glass floats ($4\frac{1}{2}$ inches in diameter) were attached to the headrope of the trawls, since aluminum floats could not withstand the pressure at depths of 500 fathoms and greater. As the amount of towing cable available on each drum did not permit double warps (tow cables) to be used in deep water, the shrimp trawl was fished from cables fastened from the two drums in tandem.

Fishing methods with the eastern trawl were similar to those commonly employed by Pacific coast otter trawl vessels. The net was set from the stern and retrieved on the starboard side. Towing speeds varied between 1.8 and 3.0 knots and averaged about 2.5 knots for most tows. Scope ratios used (ratio of tow line to depth of water), on the average, decreased as the depth of water fished increased. Ratios varied from about 3 to 1 at depths of 50 to 100 fathoms to about 2.5 to 1 at 125 to 475 fathoms. Scope ratios were as low as 1.6 to 1 at greater depths.

The catch was emptied into the starboard checker and separated by species. Estimates were made of the pounds of each species caught by multiplying its observed average weight by the total count of individuals in the catch.

The majority of sablefish length measurements used in this report were collected by Oregon Fish Commission personnel during their tagging and maturity studies. Fork-length measurements were made to the nearest centimeter and converted to inches. The Oregon Fish Commission maintains a separate contract with the Atomic Energy Commission for their sablefish migration study but used the Bureau's chartered vessel for tagging.

RESULTS

During the period covered by this report, 189 drags were made on the trackline at depths from 50 to 1,050 fathoms. Sablefish were taken at stations sampled from 50 to 650 fathoms, but were encountered only infrequently at depths greater than 475 fathoms.

AVAILABILITY BY DEPTH: The seasonal catch rate of sablefish by depth for the years 1961 through 1963 are shown in figure 3.

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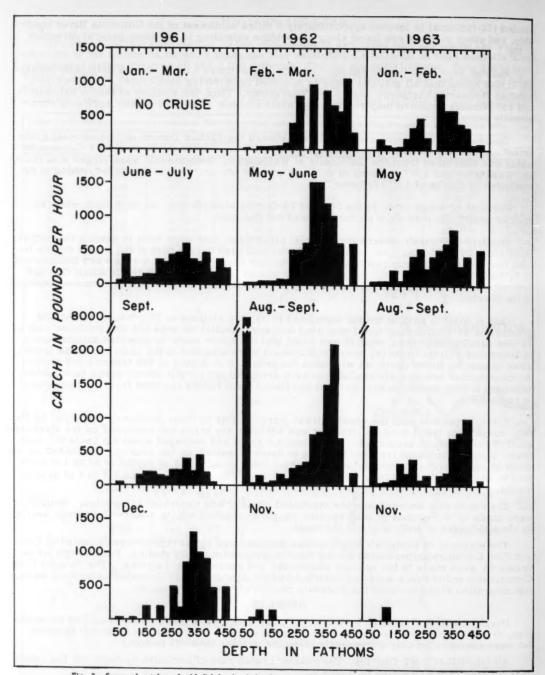


Fig. 3 - Seasonal catches of sablefish by depth for the years 1961-1963 off the mouth of the Columbia River.

Highest catch rates for sablefish were normally attained at stations from 200 to 450 fathoms in depth. A marked seasonal change in availability of the species on the Continental Shelf is implied both in 1962 and 1963. During December through June few sablefish were encountered on the Continental Shelf (50 to 100 fathoms); however, in August and September they were taken in large numbers at depths shallower than 100 fathoms. If the data are examined by years some between-year variation is noted in relative abundance and in bathymetric distribution patterns. For the most part, however, the relative abundance patterns by depth are similar for each of the three years studied. For example, in 1961 the highest catch rates for sablefish on the continental slope were attained at stations occupied from 200 down to 400 fathoms, in 1962 at depths from 225 to 450 fathoms, and in 1963 at depths from 200 to 450 fathoms. In all years relatively large catches of sablefish were encountered on the Continental Shelf (at depths of 100 fathoms or less) during the summer months.

In general, the catch rates on the continental slope were higher in 1962 than for 1961 and 1963, although the trend in availability of sablefish by depth was similar in that year to that encountered in 1961 and 1963. The availability of sablefish in deep water was particularly demonstrated in 1962 when catches exceeding 1,000 pounds per hour fishing were taken at the 300-, 325-, and 425-fathom stations, and a catch of over 2,000 pounds per hour fishing was encountered at the 375-fathom station (August-September cruise).

CATCH OF SABLEFISH IN RELATION TO CATCHOFALL FISH SPECIES: The contribution of sablefish to the total fish catch by weight was considerably greater at depths from 250 to 450 fathoms than at shallower depths (fig. 4). An exception occurred in 1962 when sablefish comprised 71 percent of the total fish catch at 50 fathoms.

In all years sablefish comprised over 50 percent of the catches at most stations from 275 to 450 fathoms. Highest contributions of sablefish at those depths were 81 percent at 325 fathoms in 1961, 90 percent at 375 fathoms in 1962, and 83 percent at 325 fathoms in 1963.

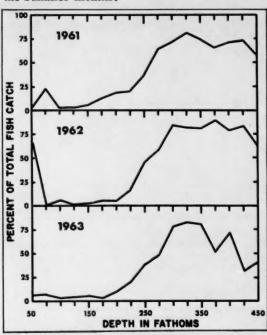


Fig. 4 - Percentage of total catch of fish species comprised of sablefish by 25-fathom depth intervals for the years 1961-1963.

SIZES OF SABLEFISH CAUGHT: Sable-fish sampled during the Columbia River trackline studies have ranged from 10 to 37 inches in length. Examination of size samples of sablefish by depth (fig. 5) suggest that larger, older fish inhabit deeper portions of the overall bathymetric range. In both 1962 and 1963 fish taken at depths from 50 to 125 fathoms were smaller than those taken from greater depths. The trend towards larger average size fish with increased depth was observed through all seasons of the year.

The average size of fish taken in the shallower stations (50 to 125 fathoms) in 1962 and 1963 was 15 inches, and within that depth range almost 98 percent of the sampled fish were less than 22 inches in length. L. Examination of table 2 shows that a sharp decrease occurs in the percentage of fish less than 22 inches in length taken at depths greater than 125 fathoms. For example, in 1962, 71 percent of the fish measured at stations from 150 to 225 fathoms were less than 22 inches in length, and at depth intervals between 250 and 325 fathoms and 350 L/Current minimum legal size allowable for commercial vessels by the States of California, Oregon, and Washington.

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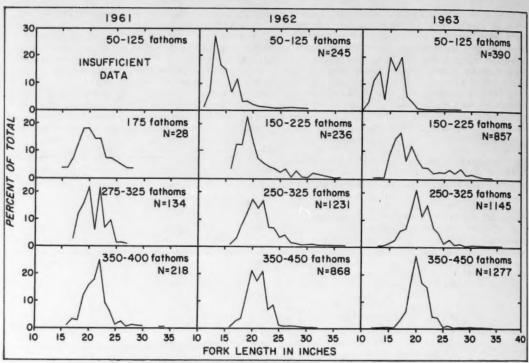


Fig. 5 - Length frequencies of sablefish by depth categories for the years 1961-1963.

to 450 fathoms the percentages of sablefish taken less than 22 inches were 56 and 57, respectively. Fish taken at depths equal to or greater than 250 fathoms averaged 6 inches larger than those sampled at stations from 50 to 125 fathoms (table 3).

Table 2 - Percentage of Measured Sablefish Less Than 22 Inches in Fork Length by Depth Intervals for the Years 1962-1963

Year	Depth Intervals in Fathoms				
lear	50-125	150-225	250-325	350-450	
1962	96 71 99 74 98 73		56 64 60	57 72 66	

Table	2	- Average	Fook	Langthe	~£ 9	Sablafish	bar	Donth
rable	3 .	Intervals					Uy	Depu

Depth Interval	Average Fork Length in Inches					
in Fathoms	1961	1962	1963	1961-1963		
50-125 150-225	20.7	15.2 20.6	15.2 19.6	15.2 19.8		
250 - 325 350 - 450	20.8	21.5	20.7	21.1		

SIZE OF MATURITY: Sablefish in spent or spawning condition were encountered during early March 1962. They were taken at depths of 300 to 450 fathoms along the trackline and at 275 fathoms off the coast of Washington by the John N. Cobb during a bottomfish survey cruise.

Gonads of fish taken from those depths were examined to determine size at maturity. Sable-fish sampled ranged from 16 to 32 inches in length. All fish smaller than 17 inches were immature, while those larger than 22 inches were mature. In the intermediate size group (17 to 22 inches), the percentage of mature fish increased with size.

DISCUSSION

The relatively high availability of sablefish on the continental slope at depths between 200 and 475 fathoms supports evidence of earlier scientific explorations that maximum abundance

of sablefish occurs in relatively deep water. The relative abundance of sablefish with depth off the Columbia River appears to be similar to that indicated for the Gulf of Alaska by Japanese commercial operations. During the period April 23-June 30, 1963, the Japanese vessel Seiju-Maru No. 3 caught 559 tons of sablefish in the Gulf of Alaska (Tanonaka and Alverson 1963). Using gill nets which ranged from 5.4 to 6 inches (stretched measure), the Japanese vessel reported good catches of sablefish at depths between 273 and 492 fathoms.

The fish taken in the gill nets averaged 27 inches in length, somewhat larger than those reported in trawl catches taken off the Columbia River at similar depths. However, this does not necessarily indicate that the average size of sablefish in the Gulf of Alaska inhabiting similar depth zones is larger than that for the Columbia River region. Gill nets are much more selective to a particular size of fish than otter trawls, therefore, the average size of fish taken by these gears is not directly compared. Regardless of the differences in average size of sablefish taken in the Gulf of Alaska as compared to those off the Columbia River, the depth range of best Japanese gill-net catches corresponds well to those of largest catches taken during Bureau explorations off the mouth of the Columbia River.

Although no evidence suggests that larger fish in deep water moved either inshore or offshore to any great extent within the year, inferential evidence suggests that the immatures in shallow water move into deeper water during winter months. The apparent differential size of sablefish with depth also suggests that there is a downward migration with increasing age.

Alverson (1960) noted the disappearance of small sablefish from inshore fishing grounds (20 to 60 fathoms) during October and November, and suggested a movement into deep water. This observation coincides with data obtained along the Columbia River trackline in that small sablefish were available only during the summer months at the 50-fathom stations.

Tagging studies on small sablefish (12 to 24 inches) conducted by Pruter (1959) at Holmes Harbor, Wash., also suggested an offshore movement which supported Alverson's supposition. Pasquale (1964) recently reported recovery of three sablefish tagged at the Holmes Harbor site from the Japanese fishery on the continental slope in the eastern Bering Sea.

Tagging in Holmes Harbor during subsequent years has shown that two size groups are present each year which are about 15 and 20 inches in length. Recoveries of tagged fish from the 15-inch group at the tagging site a year later showed growth into the 20-inch group. No recoveries were reported in the area of the tagging site for fish tagged within the 20-inch group. The absence of recoveries from that group in the area of the tagging site and their subsequent appearance in the offshore fishery suggests a movement of those fish into offshore waters and into greater depths.

Although the cooperative Bureau-A.E.C. data collected to date do not show distinct seasonal bathymetric movements for mature fish, some evidence suggests sablefish may have rather extensive north-south migrations. Holmberg and Jones (1954) reported one fish tagged off Newport, Oreg., was recovered 350 miles south of Fort Bragg, Calif., 390 days after tagging, and another tagged off Cape Beale, British Columbia, was caught some 210 miles to the north near Triangle Island, B.C., 310 days subsequent to tagging. Edson (1954) also reports one fish tagged off Middleton Island in the Gulf of Alaska was caught off Cape Flattery, Wash., showing a minimum movement of 1,230 miles. These sporadic recoveries showing long migrations seemed relatively unimportant until the recovery of the three tags in the eastern Bering Sea which were released in Holmes Harbor, Wash. This long migration seemed more important in the light of the fact that only a few offshore recoveries have been made from the Holmes Harbor tagging operations.

Low recovery rates for tagging studies conducted on sablefish have in the past been attributed to shedding of tags, faulty tags, low fishing intensity, and poor condition of tagged fish (high tagging mortality). All of these factors could have a considerable effect on the recovery rate. But perhaps of even more significance is the fact that little or no commercial fishing has occurred at depths where the species is most abundant and throughout most of the geographic range that this species inhabits. Thus low tagging recoveries may imply a large population which is subject to a relatively low fishing rate.

Ne

The data collected from the cooperative Bureau-A.E.C. study, recent Japanese fisheries in the Gulf of Alaska, and other exploratory cruises conducted by the John N. Cobb suggest a relatively large population (or populations) of sablefish inhabit waters throughout much of the eastern Pacific at depths from 200 to over 400 fathoms. It would appear that the sable fish population represents one of the large latent resources contiguous to our coast.

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SEABED DRIFTER RELEASED BY U. S. RESEARCH VESSEL RETURNED BY SOVIET TRAWLER

A seabed drifter, released by the U.S. Bureau of Commercial Fisheries research vessel Albatross IV in a program of study to trace bottom currents in the Northwest Atlantic Ocean, was recovered earlier this year by a Soviet trawler fishing south of Long Island. It was returned by way of PINRO (Polar Research of Marine Fisheries and Oceanography) located at Murmansk, apparently the home base of the trawler. It was the second seabed drifter from the Bureau's Woods Hole Biological Laboratory program that was recovered and returned by a Soviet fishing vessel.

Seabed drifters are drifting plastic objects used to obtain information about the movements of the water near the seabed. The type used in the United States has a red stem and yellow saucer-like device, with the serially numbered return labels and instructions for its return stuck to the saucer.



Created in 1849, the Department of the Interior-a department of conservation-is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs,

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States-now and in the future.

SHRIMP POTENTIAL OF THE EASTERN GULF OF GUINEA

By Alan R. Longhurst*

ABSTRACT

Recent surveys by commercial interests off the Nigerian coast have confirmed earlier research surveys which indicated the presence of two main species of commercially important shrimp in the eastern Gulf of Guinea. Of the two, the large Penaeus duoratum occurs mainly offshore in 15-25 fathoms; the smaller Parapenaeopsis attaintica occurs in larger numbers closer to the coast: in 5-15 fathoms. Neither species penetrate into the cold water below the thermocline, at which depths other but less important species occur. It is shown from a short review of published data that this situation is similar to that which occurs throughout the tropical Gulf of Guinea wherever shallowwater deposits are suitable for shrimp.

INTRODUCTION

Recent explorations by American and Norwegian interests of the shrimp stocks of the Bights of Benin and Biafra have given encouraging results (Anon 1965) and the first commercial shipments have been made to New York City by a Lagos cooperative. These results seem to confirm the earlier suggestions that a shrimp stock of potentially great value exists in the eastern Gulf of Guinea (Longhurst 1961). A review of available information about that resource-mostly in the form of mimeographed reports, difficult of access-seems desirable.

As in other places in tropical West Africa, the fleet of small otter trawlers which has worked for some years out of Lagos (fig.1) has landed small quantities of shrimp incidental to the catch of croaker, drum, grunt, threadfin, catfish, and other species which have made up the major part of the landings. Shrimp landings totaled only 15,9 metric tons in 1961 as compared with total landings of 3,480 tons of fish. Much of the shrimp was sold at very low prices for local consumption, with only a small proportion sold at a good price in the local"supermarket" trade. On many vessels the shrimp landed was simply considered the perquisite of the trawler crews and their friends.

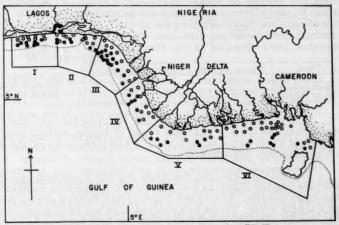


Fig. 1 - The coastline of the eastern Gulf of Guinea from Nigeria to the Cameroons. Shows the locations of trawl hauls made during the 1961-63 surveys by Federal Fisheries Service. The solid circles represent stations at which the sub-thermocline fish fauna was found; the open circles are stations at which the shallow above-thermocline fauna was found. The distribution of commercial shrimp corresponds to the distribution of the latter fauna.

SURVEY OF RESOURCES

Preliminary surveys of the crustacean resources carried out in 1961-63 by the Federal Fisheries Service of Nigeria with the research vessels <u>Kingfisher</u> and <u>Kiara</u> (fig. 2) showed what species were present and what was their approximate distribution. The commercially important shrimp consisted of two species which inhabited muddy bottoms from close to the beach out to the depth of the thermocline at about 20-25 fathoms, but did not penetrate deeper into the cold water below.

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Fig. 2 - The research vessel <u>Kiara</u> of the Federal Fisheries Service of Nigeria; an all-steel stem trawler equipped also for oceanographic survey and fisheries biology work. She was built in Great Britain for the Nigerian Government.

These two species (fig. 3) are the pink shrimp, Penaeus duorarum (which occurs also in the Gulf of Mexico) and a smaller, redder species, Parapenaeopsis atlantica, that has no common name and which is more abundant and occurs in rather shallower water than Penaeus duorarum. In experimental trawling with Kiara off Lagos in 1961, for example, the following numbers of the two species were obtained in the fish catches:

Depth	Penaeus duorarum	Parapenaeopsis atlantica
	No.	No.
5-20 fathoms	66	2,693
20-40 fathoms	50	1

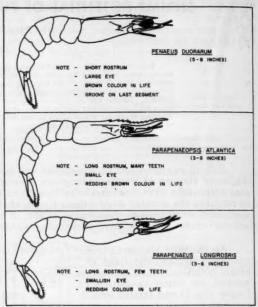


Fig. 3 - Outline drawings and characteristics of the three main species of commercially important shrimp in the eastern Gulf of Guinea; based on a figure in Crosnier 1964.

Such a catch distribution of the two species was quite typical of the incidental trawler landings of shrimp in recent years at Lagos; a third species, the striped or tiger shrimp (Penaeus kerathurus) occurs in very small numbers on the same grounds, and by itself is of no commercial importance.

Two smaller species, the white shrimp Palaemon hastatus and Hippolysmata hastatoides, occur along the Nigerian coast in very considerable numbers just outside the surf-zone during the rainy season. At Lagos a beach-seine fishery during July and August may take half a ton at a single draw. Those two species have not been taken in depths workable by a trawler and are in any case too small (less than one inch long) to be of any value to a mechanized fishery, though they are an acceptable item on the indigenous markets.

In deeper water, below the thermocline and below the range of <u>Penaeus duorarum</u> and <u>Parapenaeus stantica</u>, another species, <u>Parapenaeus longirostris</u> (fig. 3), occurs in small numbers probably as far as the continental edge in 100 fathoms.

Along the 100-fathom line and down to 200-300 fathoms there is found, as in the Gulf of Mexico, a completely different fauna of bright red shrimp of the genera Plesionika, Systellaspis, and Heterocarpus, some of which perhaps have a commercial potential if the problem of working shrimp trawls at such depths on the very steep Continental Slope can be solved satisfactorily.

During 1963, the Kiara systematically surveyed the demersal fish stocks (table 1).

Table 1 - Catch Rate of Fish for Each Depth Interval and in Each Subarea During the 1963 Kiara Survey Areas Fathoms VI II III IV 60.5 64.7 132.1 77.6 35.7 69.0 50.5 77.6 43.7 20.2 0-10 7.0 10-20 116.1 20-30 34.3 48.6 24.0 1.0 36.6 211.0 14.0 73.5 12.3 45.0 16.4 1.0 30-40 40-50 35.0 1.0 39.9 > 50 12.3

from the Dahomey border to the Cameroons and made about 120 one-hour hauls with a 40-foot otter trawl on the Nigerian continental shelf (fig. 1). During that survey, the occurrence of shrimp in the trawl catches was, of course, noted. The main results (Anon. 1963) showed, as had been

expected from earlier surveys elsewhere on the tropical West African coastline (e.g., Postel 1955; Salzen 1958; Longhurst 1963), that two main fish faunas were present: in the tropical surface water above the thermocline, on muddy deposits, a fauna dominated by croaker, spadefish, threadfin, grunter, catfish, and tonguesole; in colder water below the thermocline a fauna of reddish, rather small fish, dominated by bream, snapper, gurnard, flathead, and small horse mackerel. The greatest concentrations of shrimp were taken in the same hauls as the warm water, muddy deposit fish fauna, and those shrimp were entirely Penaeus duorarum and Parapenaeopsis atlantica along the entire coastline. Only very occasional specimens of Parapenaeus longirostris were taken, always with the deeper fish fauna.

Shrimp were taken in recordable quantities in all areas except in area I (table 2), which was predominantly sandy deposits to the west of Lagos.

The data (which are summarized from detailed station data in Anon. 1963 and Longhurst 1965b) illustrate the main characteristics of the shrimp resources: that catches are higher and shrimp easier to locate to the east of Lagos and are particularly abundant off the great Niger delta; that good catches

Table 2 - Occurrence of Shrimp by Area During the 1963 Kiara Survey Max. Catch Total No. of Depth Range1/ Rate/Hour Area Stations No. (Fathoms) of Stations with Shrimp (Kilograms) 20 ш 15 III 21 103 19 10 501 17 3 VI 1/Figure in parentheses = depth of maximum catch.

are virtually restricted to relatively shallow depths above the thermocline and follow the same pattern of abundance as do the fish catches and fall off similarly below the thermocline; that the fish catches in the Bight of Biafra were relatively very small, as were the shrimp catches.

OBSERVATIONS

The few shrimp trawlers now fishing out of Lagos (Kaufmann, pers. comm.) have found commercial quantities of Penaeus duorarum and tonguesole (Cynoglossus canariensis) at about 20 fathoms and are landing greater quantities of that shrimp species than of P. atlantica. This is unlike the earlier trawlers which were generally fishing shallower depths (around 7-10 fathoms) in search of concentrations of croaker (that fish species follows the distribution of \underline{P} , atlantica which forms a major part of its diet). The data from the <u>Kiara</u> survey summarized in this article indicates that such catches of P. duorarum will be found to extend at least 250 miles to the east, around the Niger delta; farther eastward, in the Bight of Biafra, the situation is not so clear and it is expected that much relatively unproductive mud in shallow depths will be encountered by the shrimp trawlers. At several stations in the Bight the Kiara had almost no catch of fish or shrimp for an hours' haul under satisfactory conditions, recalling much earlier reports of azoic mud in that region by the research vessel Cape St. Mary, probably due to the shallowness and permanence of the thermocline (Longhurst 1965b). The results (Williams, pers. comm.) of the Guinean Trawling Survey of C.C.T.A., recently completed, do not appear to confirm this poverty of catches in the Bight of Biafra, however, and the actual situation may be more complex than the above statement suggests.

Some further observations about the future fishery may be useful at this time of exploration and development. Oceanographic surveys off Nigeria completed by the Federal Fisheries Service in 1961-62 (Longhurst 1964) showed that there is very little seasonal fluctuation in the depth at which the thermocline occurs during a normal year off that coast and that consequently there is no strong likelihood that the depth at which the main population of Penaeus duorarum occurs will fluctuate during the year; the strong coastal upwelling off Ghana and Ivory Coast which would complicate this situation reaches Nigeria only in exceptional years and in any case hardly extends eastward of Lagos. It is known from Gulf of Mexico studies that Penaeus duorarum requires the presence of estuarine or lagoon systems in which the larvae settle, grow through the juvenile stages, and then as subadults return to the sea after perhaps 6 or 8 months of growth. In Nigeria, Penaeus duorarum juveniles are found in the lagoons behind Lagos, and in the Port Harcourt area (Sivalingham, pers. comm.) while Parapenaeopsis atlantica does not appear to enter those brackish waters—this suggests that concentrations of adult populations of P. duorarum may be expected off the entrances to such brackish-water areas during

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the dry season (November to May) while heavy concentrations of subadults may be expected at the first flushing out of those areas with the onset of the rains in June and July.

CONCLUSIONS

Thus, it seems certain that along much of the Nigerian coastline there exists a resource which, if properly managed, could form a valuable export trade for the country. The recent survey of West African shrimp by Monod (1964) and the recent trawling survey of the Cameroons continental shelf (Crosnier 1964) by the O.R.S.T.O.M.1/vessel Ombango (based in the Congo Republic) have shown that considerable resources of the same two species occur along the tropical West African coast from Senegal to the Congo wherever a muddy continental shelf and an extensive lagoon or estuarine exist.

Penaeus duorarum, which from its size will probably remain the prime commercial shrimp of the Gulf of Guinea, has been shown to occur in depths similar to those in which it is being found off Nigeria in a number of tropical West African localities: off Casamance, where a shrimp fishery is developing at Zinguinchor (Monod 1964); off Sierra Leone to the south of Freetown (Longhurst 1958); off the Ivory Coast, where the Abidjan trawlers land incidental quantities (Monod 1964); in the Cameroon Republic sector of the Bight of Biafra, where Crosnier (1964) shows that Penaeus duorarum is abundant on muddy deposits at 20-30 fathoms; off the Congo mouth and as far south as the Angola border, Rossignol and Repelin (1962) show that the species is abundant between 20 and 25 fathoms, but suggest that during the annual coastal upwelling of cold water over the continental shelf in that area the species is forced to congregate much closer to the coast (as do related Penaeid shrimp in the Gulf of Panama under similar oceanographic conditions).

Unfortunately, the development of these shrimp resources will inevitably result in conflicts of interest with existing fisheries, at least off Nigeria; the fresh fish supplies for Lagos come primarily from the catches of the small fleet of trawlers operating on much the same grounds as the shrimp trawlers will be interested in, and it is to be feared that the activities of an enlarged fleet, working with fine-meshed trawls primarily for shrimp, will rapidly destroy the stock of demersal fish which is already heavily and dangerously exploited. It seems very probable that some form of legislation will be needed to conserve the fish stocks in the future. The canoe fishermen, already hard hit by the existing trawlers, have been seeking in recent years to fish grounds so far unused by the trawlers, and have been fishing to a much greater extent than formerly for the deep Cynoglossus canariensis on the 20-fathoms grounds off Lagos -- and it is just those same grounds which appear to interest the shrimp trawlers most.

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Alabama

LANDINGS AND FISHERY TRENDS, 1964:

During 1964, fishery landings in the Alabama coastal area, including the Alabama-Tombigbee River system were 15.1 million pounds with a value of \$4.0 million--a gain of 1 percent in quantity and 7 percent in value as compared with 1963. Leading items in 1964 were shrimp (7.2 million pounds, headson weight), red snapper (2.4 million pounds), blue crab(1.8 million pounds), mullet(1.1 million pounds), and oysters (1.0 million pounds)-89 percent of the year's total was made up of those 5 varieties of fish and shellfish.



Marine landings concentrated in ports of Mobile and Baldwin Counties.

Shrimp: The 1964 shrimp landings of 7.2 million pounds (heads-on weight), valued at \$2.6 million, were down 7 percent in quantity, but up 9 percent in value from 1963. Brown shrimp made up 62 percent of the 1964 shrimp landings; white, 36 percent; and pink, 2 percent. Compared with the previous year, the catch of white shrimp in 1964 increased 24 percent while that of brown shrimp declined 19 percent. In late June 1964, Alabama exvessel shrimp prices began a gradual increase on all count sizes which continued through December.

Oysters: The 1964 oyster landings of 1.0 million pounds of meats valued at \$324,000

represented a slight increase in quantity but a small decline in value from 1963. Demand for shucked oysters was at about normal levels, although the usual price declines were noted during periods of peak production in 1964. The spring oyster harvest accounted for 79 percent of the total landings in 1964. The spring catches were made prior to fresh-water flooding and pollution that almost depleted the beds and reefs in the western areas of Mobile Bay and Alabama waters of the Mississippi Sound. Efforts were made by the Alabama Department of Conservation to improve those areas by planting seed oysters and shells obtained from other states. Reefs in the eastern portions of Mobile and Bon Secour Bays did not suffer extensive damage from the freshets and pollution.

Crab: Alabama fishermen landed approximately 1.8 million pounds of blue crab in 1964 valued at \$110,000. Compared to 1963, that was an increase of 36 percent in quantity and 48 percent in value. Crab processing firms operated 3 to 4 days per week during the spring and fall months and 5 to 6 days per week during the peak production period of the summer months. Larger firms trucked crabs from other states to meet demand during periods of low Alabama production. Prices to crab fishermen ranged from 7 cents to 10 cents a pound in 1964. The yield of crab meat from 100 pounds of live crab varied from 12 to 20 pounds of meats with an annual average of about 15 pounds. Steady market conditions pervailed for crab meat throughout the year.

Finfish: Landings of finfish (salt- and fresh-water) at Alabama ports during 1964 were 5.1 million pounds valued at \$910,000-an increase of about 5 percent in quantity and value from 1963. Red snapper was the leading item and accounted for 47 percent of the poundage and 75 percent of the value of total finfish landings in 1964. During the year new snapper vessels joined the fishing fleet, and new fishing grounds for snapper were discovered off the coast of Honduras. Black

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Species	19	64	.19	63
Fish	Lbs.	S .	Lbs,	\$
Bluefish	10,973	691	3,914	325
Buffalofish	67,695	6,937	63, 485	6,643
Catfish	45, 253	11,421	44,008	
Croaker	3, 195	271	46,635	3, 152
Drum:	1100			
Black	17,312	1,429	10,423	639
Red or redfish .	19, 295	3,041	20,506	3, 104
Flounders	162,088	24,836	107,383	20,278
Groupers	304,542	43,524	295,413	42,267
ewfish	118, 450	11,747	41,420	3,817
King whiting or		1 50	100	7.77
kingfish	574,759	28, 892	237,749	13,665
Mullet	1,071,981	55,620	1,389,604	
Paddlefish or	0			
spoonbill cat	9,962	1,270	11,228	1,336
Pompano	1,645	827	1, 146	
Sea catfish	12,801	684	5,926	
ea trout:				
Spotted	64,601	16,472	53,640	13,536
White	65, 120	3,264	77,793	
Sheepshead:				
Fresh-water	15,401	2,319	14,809	1,945
Salt-water	34,711	2,374	14,442	956
Snapper, red	2,392,875	685, 133	2,314,891	663, 422
Spanish mackerel	74, 139	8, 358	38,977	3,549
Spot	13,659	701	35,410	1,766
Other fish	485	34	2,561	286
Total fish	5,080,942	909,845	4,831,363	867,614
Shellfish		10		
Crabs, blue, hard	1,761,725	110, 335	1,296,710	74,736
Shrimp, heads-		,	2,000	,
on	7,214,738	2,629,814	7,760,033	2,419,219
Oysters	1,005,260	324, 125	995, 285	
Squid	4, 168	350	4,047	309
Total shellfish .			10,056,075	
Grand total	15,066,833	3.974.469	14,887,438	3.714.455

mullet continued as the next most important species despite a 23-percent decline in landings from 1963. That decline was offset by increased landings of flounder, grouper, jewfish, king whiting, and Spanish mackerel. Prices for most finfish species were about the same as in the previous year.

General: During 1964, the Alabama legislature adopted new regulations providing that shell oysters used for canning (hermetically sealed) have a minimum length of $2\frac{5}{8}$ inches with a 25-percent allowance for undersize oysters; the minimum size for the fresh oyster trade was established as $2\frac{7}{8}$ inches with an allowance of 5 percent for undersize oysters.

There were several changes in processing plants during the year. A fish stick producer located in Mobile Ala., transferred operations to the New England area. The only Alabama plant canning oysters and shrimp gave up that type of processing during the year.

Local shipyards were busy the entire year. Ten new vessels were constructed for local interests and several others for owners in other states. Of the 10 vessels joining the local fleet, 8 entered the shrimp fishery and 2 entered the snapper fishery.



Alaska

KING CRAB INDUSTRY BOARD NAMED BY GOVERNOR:

Alaska's Governor Egan appointed six crab industry leaders as board members under the newly passed King Crab Marketing and Quality Control Act. The 1965 Alaska Legislature created the board as an industry watchdog to maintain the quality of king crab produced in Alaska and to develop markets for the product. King crab processors are to be assessed on the basis of raw crab produced to pay the cost of the board's operations after 51 percent of the processors based on both number and quantity approve its program.

Two of the board members were appointed for 1-year terms, another two for 2-year terms, and the remaining two members were appointed for 3-year terms.

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FOREIGN FISHING ACTIVITY

OFF ALASKA, AUGUST 1965:

U.S.S.R.: The Soviet trawling fleets in the Gulf of Alaska during August 1965 concentrated their fishing activities along the 100-fathom curve between Cape Ommaney and Cape St. Elias. From the first to about the middle of August the major trawling efforts were centered from Cape Spencer to Cape St. Elias. During the first three weeks in August, a fleet made up of about 25 trawlers and 5 reefers fished in southeast Alaska off Baranof and Chichagof Islands. By the end of the month that fleet had diminished to about 6 trawlers and 1 reefer vessel.

The size of the Soviet fleet fishing in the eastern Gulf of Alaska from Cape Spencer to Cape St. Elias remained fairly stable. Some 70 trawlers, 16 reefers, and various support vessels operated in the area during August. Soviet catches in the Gulf of Alaska were predominantly Pacific ocean perch.

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Fig. 1 - Older type Soviet side trawler operating in offshore waters off Alaska.

The Soviet fishery along the eastern and Central Aleutians continued throughout August. The fleet there consisted of about 15 trawlers (including 8 to 10 BMRT's), 3 reefers, and a few support vessels. This was a slight reduction compared with the previous month's Aleutian fleet in that area.



Fig. 2 - More modern type of Soviet trawler (SRT-M) operating in Gulf of Alaska.

In the western Aleutians a small fleet operated throughout August. It consisted of about 6 BMRT stern trawlers accompanied by a few reefers and support vessels.

Late in July it was estimated that 5 Soviet SRT-M trawlers were shrimp fishing near Lighthouse Rocks east of the Shumagin Islands. That fleet was down to 2 trawlers by the first week in August and remained at that level throughout the month.



Fig. 3 - Soviet fish factoryship about 150 feet long.

Three Soviet whaling fleets operated off Alaska during the month. The factoryship Vladivostok worked in the eastern, central, and western Gulf of Alaska and the Aleut and Dalniy Vostok operated in the central and western Aleutians. Each whale factoryship was accompanied by about 9 whale killer vessels.

Japan: The Chichibu Maru and her 12 accompanying trawlers reportedly left the offshore waters off Alaska early in August and returned to Japan. A Japanese news article reported the Chichibu Maru was scheduled to sail from Hakodate, Japan, for the Bering Sea on or about August 30. She was to be accompanied by 8 trawlers of 260-ton capacity.



Fig. 4 - Japanese trawler fishing for mothership operating in offshore waters off Alaska.

The Japanese factory trawler Akebono Maru No. 71 returned to the waters off Alas-

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Fig. 5 - Japanese mothership operating in North Pacific and Bering Sea.

ka around the middle of August and fished in the vicinity of Amukta Pass in the central Aleutians for the rest of the month.

The factory trawlers Dainshin Maru No. 12 and Takachiko Maru continued fishing generally along the 100-fathom curve between Albatross Bank and the Middleton Islandarea. A third factory trawler, the Sumiyoshi Maru No. 12 was reported to have ended fishing operations early in August. The smaller Japanese trawlers Taiyo Maru No. 37, Fukuho Maru No. 2, and the Fukushin Maru No. 1 remained in the Gulf during August. They had been fishing the Albatross Bank region.



Fig. 6 - Catch of bottomfish on the deck of a Japanese trawler in North Pacific.

During August the three Japanese fish meal factoryships continued fishing in the area about 100 miles northwest of the Pribilof Islands. They were accompanied by a total of 65 trawlers.

The Japanese shrimp factoryship Einen Maru and her 15 trawlers continued to operate throughout August in the area 50 to 100 miles north of St. Paul Island.



Fig. 7 - A Japanese tarigle-net setting trawler attached to king crab factoryship in Bering Sea.

The Japanese king crab factoryships Tokei Maru and Tainichi Maru, each accompanied by 5 tangle-net setting trawlers, operated in the Bering Sea about 100 miles northwest of Port Moller during the first half of August. The Tainichi Maru was reported scheduled to leave for Japan on or about August 14. Catches by the Tokei Maru had not been as good as those of the Tainichi Maruand she remained on the crab grounds until about the end of the month.



Fig. 8 - Japanese whale factoryship operating in waters off central and western Aleutian Islands.

In late August the Japanese whale factoryship Nichiei Maru and her 7 killer vessels reportedly were beyond Alaskan waters and it was assumed they had returned to Japan. The other two Japanese whaling fleets, each accompanied by 7 whale killers, continued operations in waters off central and western Aleutian Islands.

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1965 HERRING FISHERY DOWN SHARPLY:

The 1965 southeastern Alaska commercial herring operation, limited to Washington Bay, was yielding poor catches. By August 22, only 3,000 tons had been landed compared to 21,000 tons at the same date in 1964. The catch was composed of age V fish and older, with ages VII and VIII accounting for more than 40 percent. A strong incoming age class was not evident.

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SALMON FISHING SEASON ABOUT OVER:

The 1965 salmon season ended in August except for a few areas in southeastern Alaska where seiners, gill-netters, and trollers continued fishing a while longer.



Alaska Fishery Investigations

PINK SHRIMP VERTICAL MIGRATIONS:

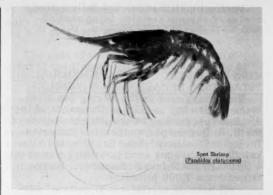
Vertical strings of pots pulled every 3 hours at the Kasitsna Bay station showed that in 50 fathoms of water the pink shrimp were at less than 12 fathoms off the bottom in midafternoon. But they occurred at all levels to the surface by midnight, with a maximum concentration at 12 fathoms below the surface. By 6 a.m. the shrimp had returned to less than 24 fathoms off the bottom.

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SHRIMP LIFE HISTORY STUDIES:

Alaskan pink shrimp (Pandalus borealis) change their sex from male to female. The reason for this is not known and there are other aspects of shrimp life history about which little is known. To learn more about the habits and movements of commercially important Alaskan shrimp, basic studies are being carried out by biologists of the U. S. Bureau of Commercial Fisheries Field Station at Kasitsna Bay near Homer, Alaska. Several species of shrimp--the pink, humpy, coon stripe, spot, and sidestripe--are being studied.

The studies have shown that young specimens of pink shrimp in Alaska are always male. Then when they are 4 years old in the North they become females, hatch their first brood of eggs and spend the rest of their lives as functioning members of that sex. When it



is time to change sex, the male parts atrophy and the female organs develop. Most of the change takes place in the spring of the year. However, pink shrimp in southern Alaska in the area of Petersburg, Wrangell, and Auke Bay change from males to females in their third year. Again the reason for this is not known. Scientists are trying to determine whether or not the pink shrimp females survive after producing one brood of young, and if so, whether they live to produce one or more subsequent broods.

The food chain of shrimp is not solved either. Their choice of food is not known at present.

It is known that Alaskan pink shrimp prefer a green mud bottom and a flat surface. However, the shrimp are not confined to the floor of the sea. They make nightly migrations to the surface. They are pelagic especially at night. When daylight hours approach, the shrimp head for the ocean depths again.

Life history and ecology studies on pink shrimp make up a new research program started by the U. S. Bureau of Commercial Fisheries 3 years ago. The research vessel <u>Sablefish</u> is being used in the shrimp investigations. An otter trawl is used for shrimp sampling. There are three sampling sites and each is sampled twice a month with pot and trawl gear.

In addition to the established sampling procedure, an effort is being made to locate the environment of postlarval, young-of-the-year pink shrimp which have not been taken in samples to date.

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Vertical distributions and daily activity cycles of shrimp are also being studied.

Note: See Commercial Fisheries Review, May 1963 p. 18.

KING CRAB STUDY REVEALS UNUSUAL "STACKING" BEHAVIOR OF JUVENILES:

Young king crab in the Bering Sea often stack up like hay in piles of thousands of individuals, according to shellfish biologists of the U. S. Bureau of Commercial Fisheries Biological Station at Auke Bay (Juneau) Alaska. They found one crab pod which was about 4 feet high and 8 feet in diameter. It contained some 2,000 juveniles.

"The stacking of the young king crabs is an odd bit of behavior which is not understood. They stack up at intervals, disperse, and stack up again," said the scientist in charge of the shellfish investigation. "This clumping or stacking of young crabs might be a protective mechanism since this crab congestion takes place in barren areas devoid of plant growth. It might also protect some of the crabs that are molting."

Observing juvenile king crab is an important part of growth and molting studies. It was not known until recently how often young king crab molt, or the age-class of adult king crab. The investigation will help explain the life history of this important commercial species about which little is known.

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SALMON EARBONES REVEAL AGE IN STUDY OF SOCKEYE RUN TO KARLUK LAKE:

It's a good thing salmon have ear bones. They not only serve the fish, of course, but also aid science by revealing the age of fish-valuable information to researchers of the U. S. Bureau of Commercial Fisheries Biological Laboratory at Auke Bay, Juneau, Alaska.

In making the age determination, the ear bone--which is smaller than a fingertip--is removed from the fish and placed under a low-powered microscope. Concentric white rings are readily seen. Those are counted. As one ring is laid down for each year of life, the number of rings reveals the age of the fish.

The age studies by biologists of the U.S. Bureau of Commercial Fisheries are part of

a research program to find reasons for the long-term decline in sockeye salmon spawning runs to Karluk Lake in Southeastern Alaska

Note: See Commercial Fisheries Review, Sept. 1965 p. 19.



American Samoa

COMPOSITION OF TUNA FLEET OPERATING FROM AMERICAN SAMOA:

Tuna long-line vessels fishing out of American Samoa as of July 1, 1965, were reported to total 67, including 36 Japanese, 17 South Korean.



Fig. 1 - Setting long line aboard a Japanese tuna long-liner near American Samoa.

and 14 Formosan vessels. It was reported by Japanese trading firms that the number of South Korean and Formosan vessels fishing out of Samoa was steadily increasing and those ves-



Fig. 2 - Unloading tuna from a long-liner at American Samoa.

sels were able to compete with Japanese vessels since their wage scales were lower. (Suisan Keizai Shimbun, August 10, 1965.)

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TRANSSHIPPING TUNA TO JAPAN:

The Kanagawa Prefectural Tuna Fishermen's Cooperative Association in Japan has studied a plan which it hoped to implement in September 1965 whereby Japanese tuna vessels operating out of American Samoa will transfer tuna considered not suitable for canning and other species (such as spearfish and sharks) to a Japanese carrier vessel for shipment to Japan. The plan provides for a cargo vessel to call at American Samoa once a month to pick up the fish. The carrier firm's vessels presently call at such places as Tahiti, Fiji Islands, and Noumea (New Caledonia). (Katsuo-Maguro Tsushin, September 1, 1965.)



California

MARINE RESEARCH CENTER BEING ESTABLISHED BY UNIVERSITY OF SOUTHERN CALIFORNIA:

A major Marine Science Research Center is being established by the University of Southern California at Santa Catalina Island, 21 miles off the southern California mainland. The first unit of the Center will be a Marine Biology Laboratory. Plans call for construction of the laboratory to begin in the fall of 1965 and to be completed in late 1966. The Marine Biology Laboratory will provide the base for development of an extensive research complex.

The Center ultimately is to include research buildings, laboratories, and other facilities for both basic and applied research in various phases of marine science. Development plans envision the involvement of private industry, as well as Government, for long-range programs of research and development in marine science and engineering.

Through its Allan Hancock Foundation, the University of Southern California has assumed the prime responsibility for planning, developing, and operating the Center. Other universities and colleges in the area are cooperating actively and will participate in the programs. Support and cooperation has been sought and received from the University of California at Los Angeles, Riverside, and Irvine, the California Institute of Technology, Pomona College, Occidental College, and the California State College System. Each of those institutions has official-

ly designated members of a Scientific Advisory Committee which will counsel on teaching and research at the Center.

The cost of the first phase in the development of the Center will amount to nearly \$2 million with about half of that sum going for the initial research building. A \$500,000 grant toward this work has been made by the National Science Foundation. The University of Southern California will match that sum from private sources. The construction of access roads and of water, power, and sewage lines by private firms represents an additional contribution of nearly \$1 million.

The location of the Marine Science Research Center at Fisherman's Cove on the eastern side of Catalina is regarded as an excellent site for marine studies. Among its advantages are: (1) diversity and abundance of temperate and subtropical marine plants and animals; (2) freedom from water pollution; (3) excellent water clarity; (4) comfortable water temperatures and a climate favorable to year-round operations; and (5) immediate access to a great variety of both shallow and deep oceanic environments.

Close proximity of the Center to the educational, scientific, and industrial components of southern California further serve to qualify it as an ideal base for marine research. (News Bureau, University of Southern California.)

Columbia River

COLUMBIA BASIN INTER-AGENCY COMMITTEE MEETS TO DISCUSS FISHERY RESOURCES:

The Columbia Basin Inter-Agency Committee planned to meet in Seattle, Wash., October 6, 1965, to consider fishery resources of the Columbia. Plans called for discussions covering fish passage research, relationships of the Columbia River to the international fishery in the Pacific Ocean, fishery implications of Canadian water storage, and other topics.

The Columbia Basin Inter-Agency Committee is made up of representatives of seven Federal agencies and the Governors of Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming.

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Federal Purchases of Fishery Products

FEDERAL SPECIFICATION PROPOSED FOR FRESH AND FROZEN SHUCKED RAW OYSTERS:

The U. S. Bureau of Commercial Fisheries has requested comments from the oyster industry on a proposed Federal Specification for Oysters--Raw, Shucked: Fresh (Chilled) and Frozen. Federal Specifications are designed to meet the requirements of Federal agencies for purchases of food products.

Copies of the proposed specification were distributed to the United States oyster industry for review and comments were to be submitted by September 30, 1965.

One feature of the proposed specification in regard to Military purchases is the inclusion of microbiological standards for market oysters as adopted at the 1964 Shellfish Sanitation Workshop of the U. S. Public Health Service. The Army has asked that those be used for their procurement.



Great Lakes Fisheries Explorations and Gear Development

LAKE MICHIGAN TRAWLING STUDIES CONTINUED:

M/V 'Kaho" Cruise 28 (August 10-28, 1965):
An 18-day exploratory fishing cruise in Green
Bay and northern Lake Michigan by the U. S.
Bureau of Commercial Fisheries research
vessel Kaho was completed on August 28,
1965. The purpose of the explorations is to
extend knowledge on the seasonal distribution,
abundance, and availability to trawl fishing
gear of important commercial fish stocks in
the Great Lakes. This work is part of the
Bureau's multidiscipline effort to help Great
Lakes fishermen overcome problems associated with changes in fish populations and
various economic setbacks.

Catches made during this cruise provided further evidence of large stocks of Lake Michigan fish which are now only partially fished. Good catches of alewife, a recent invader of Lake Michigan from the lower lakes, were obtained in Green Bay and Grand Traverse Bay. Up to 1,100 pounds per half-hour drag were caught in both areas. A good catch of 610 pounds of large chubs was made off Port

Inland. Green Bay yielded up to 520 pounds of smelt per drag. Catches of 460 and 350 pounds of sucker were made in Green Bay and Little Traverse Bay, respectively.

A total of 23,743 pounds of fish was caught in $39\frac{1}{2}$ hours of fishing time during the cruise. A general breakdown by species comprising principal portions of the total catch is shown in table.

Speci	ies Compos	ition of Total Ca During Cru		y M/V Kaho	
	Gre	en Bay	Northern Lake Michigan		
Species	Pounds Caught	Percentage of Area Catch	Pounds Caught	Percentage of Area Catch	
Alewife	10,970	80	3,964	39	
Chub	24	-	3,878	39	
Sculpin	-		821	8	
Smelt	1,511	11	594	6	
Sucker	1,025	8	503	5	
Other	157	1	296	.3	
Total	13,687	100	10,056	100	

A noteworthy sidelight of the cruise was the capture of 53 of the 1.3 million lake trout planted in northern Lake Michigan in summer 1965 under the Great Lakes Fishery Commission lake trout restoration program. The lake trout recaptures will be helpful in determining the survival, growth rates, and dispersal of the newly stocked fish.

FISHING OPERATIONS: A total of 80 drags was completed with a 52-foot (headrope) fish trawl, 51 in the open lake, 22 in Green Bay, and 7 in Grand and Little Traverse Bays. All drags were of 30 minutes each except 4 which were ended early due to snags, rough bottom, or set fishing gear. Major trawl damage occurred when the net snagged at 10 and 35 fathoms off Ludington, Mich.

FISHING RESULTS IN NORTHERN LAKE MIGHICAN: Alewife were available in relatively small quantities at all of the open lake stations. The largest catch of 400 pounds was made off Beaver Island at 12 fathoms. No alewife at all were caught off Frankfort since rough bottom conditions prevent trawling at depths shallower than 25 fathoms. Alewife fishing was better in Grand Traverse Bay and Little Traverse Bay where 1,100 pounds and 450 pounds, respectively, were taken at 14 and 15 fathoms.

Chubs were caught in commercially significant quantities near Manistique where 610 pounds (160 pounds of No. 1 and jumbo size) were caught at 20 fathoms off Seul Choix Point. Other species caught in amounts of

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100 pounds or more included sculpin, smelt, stickleback, and sucker. Of the small lake trout caught, 52 ranging in size from 5.0 to 8.3 inches, were taken in the open lake and the Traverse Bays at depths ranging from 10 to 35 fathoms.

Species other than alewife and chubs taken in northern Lake Michigan included, among others: sculpin, smelt, white sucker, and common whitefish.

FISHING RESULTS IN GREEN BAY: Alewife were taken in all of the 22 trawl drags in Green Bay accounting for 80 percent of the total catch. Catch rates ranged from 20 to 1,100 pounds and averaged 500 pounds a half hour. A total of 10,970 pounds was landed in 11hours' effort with the most productive depths between 10 and 15 fathoms.

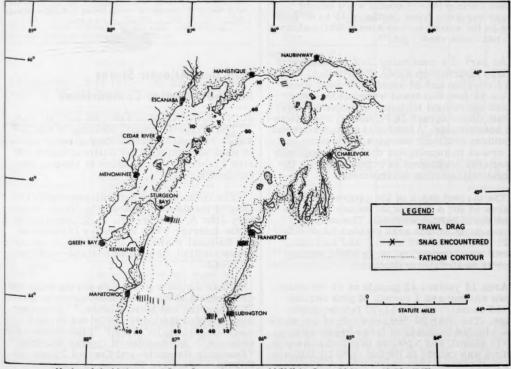
Smelt were the next most abundant species in Green Bay and comprised 11 percent of the total, or 1,511 pounds. They occurred in

17 of the drags in amounts from 2 to 520 pounds with an average catch of 90 pounds per drag. The best smelt catch was in 10 fathoms $4\frac{1}{2}$ miles SE. of Pestingo Point.

Sucker were also caught in commercially significant amounts in Green Bay, particularly in the southern portion. Amounts up to 460 pounds per drag were landed with an average catch of 80 pounds for the 13 drags in which sucker occurred. A total of 1,025 pounds, or 8 percent, of the catch was sucker, of which 57 percent was white sucker and 43 percent longnose sucker. The best landing of 460 pounds was in 10 fathoms just south of Chambers Island.

Yellow perch occurred in 9 drags but in amounts up to only 20 pounds. One small finclipped lake trout was recovered in 22 fathoms near Washington Island.

Species other than alewife, smelt, and sucker in the Green Bay trawl catch included,



Northern Lake Michigan and Green Bay explorations by M/V Kaho Cruise 28 (August 10-28, 1965).

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among others: yellow perch, common whitefish, burbot, chub, and cisco.

OTHER DATA: Surface water temperatures taken in Lake Michigan during the cruise ranged from 500 to 640 F. and in Green Bay from 65° to 69° F. Fishing (bottom) temperatures ranged from 37° to 53° F. in Lake Michigan and 46° to 69° F. in Green Bay. Note: See Commercial Fisheries Review, September 1965 p. 27.



Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-32 (August 10-21, 1965): Brown shrimp were predominant in the catches made during this cruise by the chartered research vessel Gus III of the U.S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex. As a result of offshore migrations from nursery areas during late spring and early summer, medium brown shrimp (41-50 count) were caught in larger numbers from depths of 11 to 40 fathoms in the entire survey area. White shrimp catches were very light.

As part of a continuing Gulf of Mexico shrimp distribution study, 8 statistical areas were covered and 33 standard 3-hour tows with a 45-foot flat trawl were made. Other cruise operations included 48 plankton tows, 49 bathythermograph (BT), and 177 water (Nansen bottle) casts. A total of 24 shell dredge and 17 bottom sediment samples were taken on the cruise to supplement data on ecologically associated organisms in connection with the commercial shrimp environment.

The largest catch of the cruise was made in area 16 for a total of 80 pounds from the three depth ranges worked. The over 20fathom depth of that area yielded 63 pounds of 26-30 count brown shrimp and smaller quantities of brown and large white shrimp from up to 10-fathom depth.

Area 18 yielded 42 pounds of 41-50 count brown shrimp and 3 pounds of pink shrimp (31-40 count) from the 11-20 fathom depth range. The over 20-fathom depth of the same area yielded 8 pounds of large brown shrimp (12-15 count), and 5 pounds of brown and white shrimp was caught in depths up to 10 fathoms.

The over 20-fathom depth of area 13 yielded 26 pounds of 31-40 count brown shrimp. Other depths in the same area accounted for 10 pounds of very small brown shrimp and a few pounds of 15-20 count white shrimp.

Although white shrimp catches were quite small in all areas worked, they almost consistently ran to large sizes (15-20 count), mostly from the up to 10-fathom depth range. Pink shrimp taken on the cruise was from three areas -- mostly 31-40 count.

The vessel also occupied the third in a series of 24-hour current measurement stations in 8 fathoms of water south of Morgan

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

(2) See Commercial Fisheries Review, September 1965 p. 29.

(3) Following completion of cruise GUS-30 during June in Gulf of Mexico offshore waters, the Gus III was used to carry out other types of work (Cruise GUS-31). The work included studies of the advantage of the card and of the himp arts. of the selective characteristics of the cod end of shrimp nets, comparisons of the relative fishing power of the Gus III and commercial shrimp trawlers, and shrimp staining experiments. The results of that work are to be analyzed. The comparative studies showed that the average catch of shrimp by the Gus III was similar to that of 40 commercial vessels fishing in the same area.



Gulf and Atlantic States Marine Fisheries Commissions

JOINT ANNUAL MEETING IN MIAMI, FLA.: The Sixteenth Annual Meeting of the Gulf States Marine Fisheries Commission was held in joint session with the Atlantic States Marine Fisheries Commission at Miami, Fla., October 6-8, 1965.

The opening joint general session on October 6 included an address by Under Secretary John A. Carver, Jr., U. S. Department of the Interior. The Executive Director of the National Fisheries Institute gave an address entitled, "Fish and Seafood -- A Kickoff to Profit."

Other subjects presented during talks and discussions at the general sessions included: 'Glamourize and Merchandise," "Economic Analysis and Business Decisions in the Commercial Fishing Industry," "Fish Protein Concentrate," "Automation of Oyster Shucking," "Pesticide Research and Control Programs-USPHS," "Positive Thinking in Marine Fishd-

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ery Management," and "Commercial Fisheries Research and Development Act of 1964."



Industrial Fishery Products

U. S. FISH MEAL, OIL, AND SOLUBLES:

Production by Areas, August 1965: Preliminary data on U. S. production of fish meal, oil, and solubles for August 1965 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

Area	Meal	Oil	Solubles
August 1965; East & Gulf Coasts.	Short Tons 34, 853	1,000 Pounds 31,511	Short Tons 17, 342
West Coast 2/	2,494 37,347	1,839 33,350	17, 342
Total	3/, 34/	33,330	17,342
Total	173,831	148, 198	70,038
lanAug. 1964: Total.	175, 360	140,766	71,707

Production, July 1965: During July 1965, a total of 48,462 tons of fish meal and 40.6

July 10	OO WICH	Compa	II IPOUP		
	Jul		Jan	Total	
Product	1/1965	1964	1/1965	1964	1964
Fish Meal and Scrap:			(Short To	ns)	
Herring.	4,317	3,317	6,710	4,960	8,881
Menhaden 2/	38,546	34,018	103,022	99,448	160,349
Tuna and mackerel	2,855	2,344	14,252	11,176	21,113
Unclassified	2,744	5,497	12,500	26,243	34,809
Total	48,462	45,176	136,484	141,827	225,152
Shellfish, marine-animal meal and scrap	3/	3/	3/	3/	10,100
Grand total meal and scrap	3/	3/	3/	3/	235,252
Fish solubles: Menhaden	16,184	15,774	41,256	42,362	68,738
Other	2,340	2,240	11,440	14,677	24,558
Total	18,524	18,014		57,039	93,296
			(1,000 Lb	8.)	
Oil, body: Herring	3,242	3,716	4,255	5,937	10,354
Menhaden 2/	35,554	28,183		99,325	157,730
Tuna and mackerel	623	479		1,987	4,816
Other (including whale)	56	1,400		5,153	7,298
Total oil	40,575	33,778	114,848	112,402	180,198

million pounds of marine-animal oil was produced in the United States. Compared with July 1964 this was an increase of 3,286 tons of fish meal and about 6.8 million pounds of marine-animal oil. Fish solubles production amounted to 18,524 tons--an increase of 510 tons as compared with July 1964.

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Major Indicators for U. S. Supply, July 1965: United States production of fish meal and fish oil in July 1965 was higher by 7.3 and 20.1 percent, respectively, as compared with July 1964. Production of fish solubles was higher by 2.8 percent.

Major Indicator		S. Supply		Meal, Sol	lubles,
Item and Period	1/1965	1964	1963	1962	1961
		(SI	nort Tons		
Fish Meal: Production: July JanJuly 2/ Year 3/	48,462 136,484	45,176 141,827 235,252	38,492 129,544 255,907	55,602 177,438 312,259	63,435 165,937 311,265
Imports: July JanJuly Year	18,693 228,551	28,863 285,292 439,143	43,223 225,157 376,321	25,857 166,743 252,307	18,710 126,536 217,845
Fish Solubles 4/: Production: July JanJuly 2/ Year	18,524 52,696	18,014 57,039 93,926	17,709 60,534 107,402	22,207 73,714 124,649	22,589 62,789 112,254
Imports: July JanJuly Year	123 3,357	1,506 3,557 4,505	330 2,769 7,112	6,308	708 1,927 6,738
Fish Oils: Production: July JanJuly 2/ Year	40,575	33,778 112,402 180,198	28,990 98,579 185,827	47,695 143,317 250,075	57,238 146,264 258,118
Exports: July JanJuly Year	16,145 46,315	40,449 96,588 151,469	29,343 127,149 262,342	128 63,133 123,050	4,421 72,549 122,486

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duction in 1904. This mean, to personal the percent.

J'Small amounts (10,000 to 25,000 tons) of shellfish and marine animal meal and scrap not reported monthly are included in annual totals.

J'No homogenised fish was produced in 1964 or during the first 7 months of 1965.

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U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-July 1965: Based on domestic production and imports, the United States available supply of fish meal for the first 7 months in 1965 amounted to 365,035 short tons--62,084 tons (or 14.5 per-

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	JanJuly		Total	
Item	1/1965	1964	1964	
	(Short Tons)			
Fish Meal and Scrap:		1		
Domestic production:	100 000	00 440	100 04	
Menhaden	103,022	99,448	160,34	
Tuna and mackerel	14,252	11,176	21,113	
Other	6,710	4,960	8,88	
Other	12,500	26,243	44,25	
Total production	136,484	141,827	235,252	
Imports:	04 000	04 500		
	24,906	34,509	54,76	
Chile	192,921	227,325	348,02	
	5,128	10,587	12,94	
Norway	25	10 700	10.50	
Other countries	1,900	10,738	18,58	
Other countries	3,671	2,133	4,82	
Total imports	228,551	285,292	439,143	
Available fish meal supply	365,035	427,119	674,39	
Fish Solubles:				
Domestic production 2/	52,696	57,039	93,29	
Imports:				
Canada	1,006	1,162	1,55	
So. Africa Rep	-	860	98'	
Other countries	2,347	1,535	1,96	
Total imports	3,353	3,557	4,50	
Available fish solubles supply /Freliminary.	56,049	60,596	97,80	

cent) less than during the same period in 1964. Domestic production was 5,343 tons (or 3.8 percent) less, and imports were 56,741 tons (or 19.9 percent) lower than in January-July 1964. Peru continued to lead other countries with shipments of 192,921 tons.

The United States supply of fish solubles during January-July 1965 amounted to 56,049 tons--a decrease of 7.5 percent as compared with the same period in 1964. Domestic production dropped 7.6 percent and imports of fish solubles decreased 5.7 percent.



Inland Fisheries Explorations and Gear Development

OAHE RESERVOIR TRAWLING STUDIES:

Reservoir Research Vessel "Hiodon"

Cruise 1 (July 14-22, 1965): To delineate areas suitable for bottom trawling, test the effectiveness of commercial trawls as fishing gear, and collect catch and biological data were the specific objectives of this cruise in the upper one-third of Oahe Reservoir. This 8-day exploratory trawling operation by the new reservoir fishery research vessel Hiodon of the U.S. Bureau of Com-

mercial Fisheries was completed on July 22, 1965. Tows were made between reservoir miles 122 and 183 of the Reservoir in South and North Dakota.

Fish catches were low in most areas fished. Nineteen species of fish were taken but crappie, yellow perch, carp, drum, and shovelnose sturgeon dominated the catches. No species or sizes of fish were taken that normally are marketed by the existing commercial fisheries.



New reservoir exploratory fishing vessel <u>Hiodon</u>. Leaving the Kalamazoo River pier near Saugatuck, Mich., in mid-April 1965 to begin her 2,000-mile trip by lake, river, and highway to Oahe Reservoir—one of the largest Missouri River impoundments.

FISHING OPERATIONS: A total of 8 tows was made with a 55-foot (headrope length) Gulf of Mexico-type fish trawl and 14 tows were made with a 35-foot trawl of similar design. Mesh size (extended measure) of the cod end of the 55-foot trawl was 14 inches and $\frac{1}{2}$ inch in the 35-foot trawl. Nineteen tows were made over the old river channel and 3 tows were made over inundated bottomlands. Depths trawled ranged from 12 to 48 feet. All tows were 15 minutes each except 5 which were ended when the net became fouled on bottom obstructions. Bottom topography and depths were recorded continuously with a high resolution "white line"type depth-recorder.

FISHING RESULTS: The total catch in 22 tows was 1,394 fish weighing 700 pounds. The average catch per tow was 31.7 pounds. The number of tows with catches of the most common fish were: 17 with carp; 13 with shovelnose sturgeon and fresh-water drum; and 11 with yellow perch. Highest catches per tow for tows catching fish were crappie 10.6 pounds, carpsucker 10.3, carp 9.5, shovelnose sturgeon 6.2, and drum 5.3 pounds.

The 35-foot trawl caught 44,4 pounds of fish per tow and the 55-foot trawl took 7.7

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pounds per tow. Tows over inundated bottomlands caught fish at much higher rates than over the older river channel.

The cruise was beset with a number of operational difficulties which were encountered during the cruise. Difficulties were in the slow speed at which the 55-foot trawl was towed and pulled to the boat at the completion of each tow. The difference in the catch of the two sizes of trawl may have been due to the difficulty in towing and pulling in the 55-foot trawl at fast speeds—a problem less serious with the 35-foot trawl. The vessel returned early to Mobridge to make some minor engine adjustments.

Two trawls were badly torn during the cruise. Trawls frequently picked up large quantities of organic debris, bushes, logs, and on several occasions, large free-floating trees. Tows over carefully selected bottom-lands yielded greater catches and less debris than tows over the old river channels. Continued trawling throughout the reservoir is certain to establish conditions for best fishing results and awareness of operational problems.

OTHER DATA: Hydrographic data collected showed that surface waters were progressively warmer and secchi disc readings higher from reservoir mile 183 to reservoir mile 122. Surface water temperatures ranged from 65° F. to 77° F., and secchi disc readings ranged from 2 to 10 feet.

Reservoir Research Vessel "Hiodon" Cruise 3 (August 24-September 1, 1965): This later cruise by the Hiodon in the Oahe Reservoir, between reservoir miles 122 and 131, ended early because of severe trawl damage caused by submerged free-floating trees.

FISHING OPERATIONS: The trawls used during the cruise were the same as those used on the earlier cruises. Only 7 complete 15-minute tows were made with the 35-foot trawland 2 tows with the 55-foot trawl. Depths trawled ranged from 18 to 48 feet. Eight tows were made over old fields and one over the old river channel.

FISHING RESULTS: The total catch of the 35-foot trawl consisted of 1,078 fish (older than age group II) weighing 703 pounds. The average catch per tow was 154 fish weighing 100 pounds. Single catches ranged from 9.6 to 180.8 pounds. The average catch (in pounds)

of each species per tow was: carp 62.9; carpsucker 12.3; perch 7.0; channel catfish 3.6; drum 3.4; northern pike 3.2; and 12 other species 8.0 pounds. The average individual fish weight (in pounds) of several species was: carp 1.6; carpsucker 1.5; yellow perch 0.1; channel catfish 0.4; northern pike 4.5; drum 0.4; and smallmouth buffalo 1.1.

Only 9 yearling fish were caught in the 35-foot trawl. The most abundant young-of-the-year fish taken were black bullhead, yellow perch, white bass, crappie, and drum. The two 15-minute tows made with the 55-foot trawl yielded 309 fish weighing 419.6 pounds. Average per tow was 154 fish and 210 pounds. Carp made up 83.4 percent of the catch by weight. The carp averaged 1.8 pounds in weight--mostly fish of the 1962 year-class.

Trawl catches on this cruise ranged from 9.6 to 211.7 pounds and averaged 124.7 pounds. Carp made up 70 percent of the total catch. Although a number of factors affect the rate of catch, the amount of debris on the bottom in many areas greatly reduces the catch. Apparently water currents move toward and down the old Missouri River channel which results in the deposition of organic materials on the bottom of these seemingly prime trawling areas. Bushes, shreds of cottonwood tree bark, twigs, and grass often are picked up by the trawl in such quantity that the open face of the cod end of the trawl may be completely choked with bushels of debris. The problem is less serious over old bottomlands and least serious over newly inundated pasture land. That tows are sometimes made over old haystacks and manure piles, or through barbed wire fences is evident when the trawls are pulled aboard. Submerged free-floating trees may be found anywhere and may shift location daily.

Charts are used to locate and delineate the various bottomlands, pastures, forested areas, and old river channel. The depth-finder is used over probable trawling areas to define depths, contours, and area that may be trawled. Free-floating submerged trees and bushy areas usually cannot be detected on the depth-recorder.

Note: See Commercial Fisheries Review, August 1965 p. 42.



Marketing

FISH 'N' SEAFOOD PARADE:

During October 1965 the fishery industry conducted an intensive advertising and publicity campaign and provided point-of-purchase material to acquaint food buyers with benefits of serving fish and seafoods.

As part of the fall promotional program, the U. S. Bureau of Commercial Fisheries provided various information media materials emphasizing ease of preparation, versatility, and nutritional value of fishery products.

The Bureau's director said, "Continuing research to improve methods of refrigeration and transportation is making high quality fish and seafood products available to more people than ever before. Americans are extremely interested in the nutritional values of food today and it has long been known that fishery products are excellent sources of protein, minerals, and essential B-complex vitamins."

The Department of Agriculture listed "Fish 'n' Seafood Parade" as a merchandising opportunity on a national basis in its October plentiful food literature.

This was the 12th successive year of the national fall promotion program.



Michigan

CHANGES IN GREAT LAKES COMMERCIAL FISHING REGULATIONS APPROVED:

Several changes proposed earlier in Michigan's Great Lakes commercial fishing regulations were approved in August 1965 by that State's Conservation Commission. One of the changes closed commercial fishing for lake trout in Lake Michigan as of October 1, 1965. The closure was timed to protect 1.2 million yearling lake trout planted in Lake Michigan in June 1965.

The same restriction has been in effect for several years in Lake Superior where the lake trout restoration program has made its greatest gains since the start of lamprey control and fish plantings in the late 1950's. Another action taken by the Commission at its meeting in August is a November 1-30 closed season on whitefish in Lakes Michigan, Huron, and Superior to protect the fish from commercial fishermen during their peak spawning period in those waters. Closed seasons for taking whitefish by commercial netting have previously run from October 15 through December 10 in Lakes Michigan and Huron, and from November 1-26 in Lake Superior.

Another measure approved by the Commission will lift the depth restriction on using trap and pound nets to take lake trout and whitefish in those three lakes. Commercial fishermen operating in those waters have for years not been allowed to set impounding nets in waters deeper than 80 feet for catching either kind of fish.

The final change adopted by the Commission will remove the minimum size limit on yellow perch in Lake Erie.

All of these commercial fishing changes became effective on October 1, 1965. (News Bulletin, Michigan Department of Conservation, August 19, 1965.)

Note: See Commercial Fisheries Review, August 1965 p. 37.



National Fish and Wildlife Library

NEW REFERENCE SERVICE TO AID RESEARCH:

The establishment of a national fish and wildlife library reference service was announced September 16, 1965, by the Assistant Secretary of the Interior for Fish and Wildlife and Parks. The new reference facility, developed in cooperation with the International Association of Game, Fish and Conservation Commissioners, will serve State fish and game departments through the Interior Department Library in Washington, D. C., and the Denver Public Library in Colorado.

The reference program is designed to help fish and wildlife research workers on State conservation agency projects partially financed under the Federal Aid in Fish and Wildlife Restoration Acts. Each State, as well as Guam, Puerto Rico, and the Virgin Islander men life. ice vor to

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Islands, participates in the Federal Aid programs administered by the Interior Department's Bureau of Sport Fisheries and Wildlife. Financing of the library reference service will come from the Federal Aid funds prior to their apportionment to the States.

The Director of Interior's Bureau of Sport Fisheries and Wildlife said reference materials will be so organized that a single request will automatically receive attention from both the Denver Public Library, where all unpublished reports are to be housed, and the Library of the Department of the Interior, where publications will be kept. He said, "Establishment of the national fish and wildlife library reference service will provide. for the first time, a convenient means for research biologists to obtain specialized reference materials. Use of research findings of the past will improve coordination and avoid possible duplication of effort. I urge all State and Federal fish and wildlife workers to take full advantage of this new research facility."



New Jersey

ARTIFICIAL "SEAWEED" USED IN

COASTAL EROSION-PREVENTION TESTS: In the summer of 1965, New Jersey announced plans to test plastic ("polypropylene") strings as artificial "seaweed" in an effort to prevent coastal erosion. The tests were to begin in early August 1965 off Lookout Tower at Island Beach State Park in New Jersey. It was hoped that the artificial seaweed would help hold sandy ocean bottoms together and control currents and waves, thereby protecting the shoreline. New Jersey has no natural seaweed beds.

An oil firm supplied materials for the test to the New Jersey State Department of Conservation and Economic Development. That agency built a grid, 90 by 900 feet, containing clusters of the artificial material spaced 3 feet apart. Two types of polypropylene seaweed were to be tested. Half of the grid contained fronds of slit polypropylene film, the other half contained polypropylene monofilament.

The grid was to be planted with a specially designed anchoring formation 800 feet offshore, parallel to the coastline, in 15 feet of water. About 12 tons of lead weights will keep it from floating away.

A 2-year study of the artificial seaweed grid is planned by New Jersey. A log of weather in the area will be kept and periodic soundings and bottom samples will be taken.

The first artificial seaweed test took place on a limited scale 2 years ago in Denmark, when fronds of polypropylene film were planted in a 40-square-meter grid in the Thyboren Channel. During that test it was found that sand accumulated on the channel floor behind and in the grid, within an area of approximately 500 feet from the plant-

More extensive tests have since been initiated in Denmark and England. (Oil, Paint, and Drug Reporter, August 2, 1965.)

The British experiment with artificial ("polypropylene") seaweed is being conducted at Bournemouth, England, and is expected to continue into 1966. As in the Danish and New Jersey tests, the object of the British experiment is to prevent erosion by trapping and building up sand offshore, according to News Scientist, July 29, 1965. That periodical said two theories have been advanced to explain the trapping action. One is that the seaweed reduces shear stress on the submerged shore by concentrating it within itself; the other is that it slightly reduces the orbital velocity of sand particles as they describe ellipses due to the motion of the waves. If the first theory is correct, seaweed should be equally effective both in regions of steady current and in those having alternating wave motion; if the second is correct, it should have no effect in steady currents. It is hoped that the British tests will indicate which mechanism predominates.

Note: See Commercial Fisheries Review, Oct. 1964 p. 56.

North Atlantic Fisheries Explorations and Gear Development

TUNA AND SWORDFISH DISTRIBUTION STUDIES IN

NORTHWEST ATLANTIC CONTINUED:

M/V "Delaware" Cruise 65-7 (July 23-August 5, 1965): Survey of the seasonal distribution and abundance of tuna and swordfish in the Northwest Atlantic, using longline sampling gear, was continued during this two-week cruise by the U.S. Bureau of Com-

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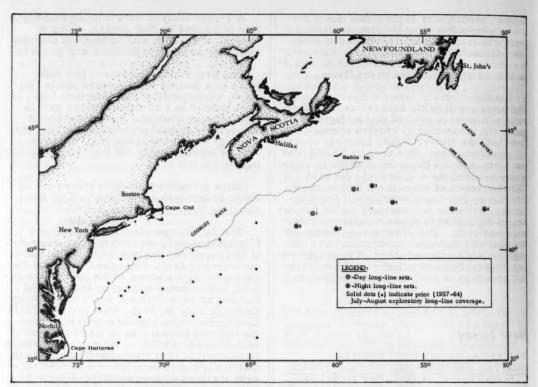


Fig. 1 - Station pattern of M/V Delaware Cruise 65-7 (July 23-August 5, 1965).

mercial Fisheries exploratory fishing vessel Delaware. It was the 15th exploratory longline cruise for the vessel since spring 1957 to investigate latent pelagic fish resources in oceanic areas. Previous exploratory coverage during July-August in oceanic (over 100 fathoms depth) waters north of 35 degrees North Latitude has totaled 21 long-line sets made in the western portion, west of 64 degrees West Longitude.

LONG-LINE SETS AND CATCH: Three sets of long-line gear were made during daylight hours, and 5 sets were made at night, with a total of 4,600 hooks fished. Hooks baited with squid and herring were spaced at 20-fathom intervals and fished at estimated depths varying from 15 to 35 fathoms. A 600-hook set covered a horizontal distance of approximately 13 nautical miles.

Tuna and swordfish catches in the area surveyed were minimal. Albacore (Thunnus

alalunga) were taken at four stations with a maximum catch rate of 0.5 fish per 100 hooks at one of the stations. Average round weight of albacore tuna caught was 41 pounds and the range was 33 to 56 pounds. Four of the stations covered yielded big-eyed tuna (Thunnus obesus) with a maximum catch rate of 0.3 fish per 100 hooks at two stations. Average round weight of big-eyed tuna was 93 pounds and the range was $16\frac{3}{4}$ to 170 pounds. The $16\frac{3}{4}$ -pound specimen is believed to be one of the smallest of that species taken in the western North Atlantic. A single yellowfin tuna (Thunnus albacares) weighing $14\frac{1}{4}$ pounds was taken at one of the stations.

Swordfish (Xiphias gladius) were caught at three night stations, with a maximum catch rate of 0.3 fish per 100 hooks at one of the three stations. Average round weight was 111 pounds and the range was 60 to 160 pounds. The 2 smaller fish were male (60 and 88 pounds) and the larger 2 were female (134 and 160 pounds).

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Fig. 2 - Long-line gear on M/V <u>Delaware</u> is set at night from the port-quarter deck. Baited branchlines (5-fathoms) are clipped on the mainline at 20-fathom intervals. Note hinged cover of tub which opens as a bait tray. Hooks and baits (squid and herring) are separated by metal dividers to prevent marks.

Other long-line catches of particular note were: 4 white marlin (Tetrapturus albidus), 1 pelagic stingray (Dasyatis violacca), and 1 gempylid (Lepidocybium flavo-brunneum).

THERMAL ENVIRONMENT: While survey of the geographical area was the primary mission of the cruise, attention also was given in selection of working locations within thermal environments most conducive to pelagic fish occurrence. This was accomplished through application of synoptic sea surface temperature information, received by radiofacsimile equipment aboard the vessel, and augmented by vertical (subsurface) water temperature profile data obtained from bathythermograph (BT) casts on location. Fishing results, therefore, suggest that within the geographic area worked, under observed thermal environment conditions, three species of tuna, and swordfish, were available in very small numbers to the gear fished.

LONG-LINE GEAR OPERATIONS: Changes and improvements in handling of long-line gear and deployment of deck personnel permitted a reduction of manpower requirements with no loss in operating time or efficiency. Four men on deck set and hauled long-line gear at the same rate previously requiring 6 men.

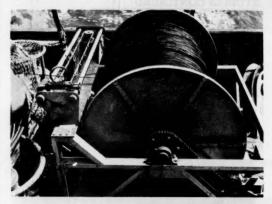


Fig. 3 - A hydraulic long-line reel used during M/V <u>Delaware</u> cruise carried 20 miles of ¹/₄-inch mainline spooled by an automatic levelwind.

Earlier improvements have been reported from two previous cruises by the vessel Delaware. Among the modifications during this cruise were: (1) shift of the setout operation aft to the port-quarter rail, (2) reduction in number of 5-fathom coiled branchlines in tubs from 50 to 30, (3) separation of baited hooks, and (4) triple fairleading of the mainline from the hydraulic reel overboard to control line vibration. Further changes to the gear are anticipated during subsequent cruises. Replacement of hand-operated clips with a mechanical device to attach and detach branchlines to the mainline is expected to further reduce setting and hauling rates.

OTHER ACCOMPLISHMENTS AND OB-SERVATIONS: In cooperation with the tunatagging program at Woods Hole Oceanographic Institution and the shark-tagging program of the Shark Research Panel, American Institute of Biological Sciences, a single big-eyed tuna and 24 sharks of assorted species were marked and released. Flesh samples and livers from two big-eyed tuna, 3 albacore tuna, and 2 white marlin were frozen for investigations at Scripps Institution of Oceanography on concentrations of fallout radionuclides in the marine environment. BT messages were transmitted to the Naval Oceanographic Office when the vessel was within contact range of Coast Guard radio stations. Note: See Commercial Fisheries Review, July 1965 p. 32.

TRAWL GEAR EVALUATION STUDIES CONTINUED:

M/V "Delaware" Cruise 65-8 (August 11-20, 1965): Comparative studies of fishing trawls initiated during a June 1965 cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel <u>Delaware</u> were continued on this cruise. The two nets used in the studies were a No. 41 trawl and an Atlantic Western trawl.



Fig. 1 - Portion of deck of exploratory fishing Delaware.

The No. 41 trawl used was of No. 54 braided nylon. Roller gear was comprised of a 15-foot center section of 18-inch rubber rollers. Each wing had 15 feet of 16-inch wooden rollers and rounded sweep ropes. The trawl was rigged with 5-fathom legs and a 10-fathom ground cable. A set of rectangular wooden trawl doors, measuring 10 feet 6 inches by 4 feet 6 inches and weighing 1,480 pounds each (dry), were used with this net.

The Atlantic Western trawl was constructed from No. 150 polyethylene twine and rigged with 20-inch rollers as on Cruise 65-5. The 10-fathom ground cables used during the first experiment were eliminated early in this cruise to help prevent tear-ups. The trawl doors used were oval type weighing 2,200 pounds each and measuring 10 feet 4 inches by 5 feet 10 inches.

A towing schedule was set up to equate the number of tows with each net during periods of daylight and darkness. All tows were for 1 hour with the exception of a few $1\frac{1}{2}$ hour tows made concurrently with commercial fishing vessels in the immediate vicinity.

Five areas on Georges Bank were fished; they were two areas along the Northern Edge, the easterly end of the Northern Edge, the easterly side of the Leg, and the Northeast Peak.

Fishing on this cruise was extremely poor in all areas. Average catches for both nets for the trip were only a little over 200 pounds per 1-hour tow, and the best catch was 1,800 pounds.

Only one tear-up, resulting in damage to the wings of the Atlantic Western trawl, was encountered in over 50 tows. The sections for that net were cut and finished after the tear-up and repairs were made. Pre-cut; sections would have allowed the repairs to be made with no difficulty in a short time.



Fig. 2 - Fish in trawl net of the M/V Delaware.

Difficulty was experienced with the oval doors during the trip. The forward door had a tendency to lay over on its back and some scuffing of the wood resulted. It was found that

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that if the wires were held tightly enough when setting out, the problem could be minimized.

As neither net seemed to be fishing properly, the catch results of this cruise cannot be considered a valid assessment of the relative catching ability of the two trawls. In view of the problems encountered, further work will be necessary to obtain an accurate evaluation of the trawls. Additional cruise time was to be scheduled to effect proper gear performance and to continue comparative fishing trials.

Note: See Commercial Fisheries Review, September 1965 p. 36.



North Atlantic Fisheries Investigations

LOBSTER AND SEA HERRING POPULATIONS AND LARVAE STUDIED:

M/V "Delaware" Cruise 65-9--Herring Investigations (August 26-30); Lobster Investigations (August 31-September 4, 1965); Herring and lobster investigations were conducted during this cruise in the North Atlantic Ocean (northern part of Georges Bank, Little Georges, and Corsair and Veatch's Canyons) by the U. S. Bureau of Commercial Fisheries research vessel Delaware. The objectives were to: (1) sample populations of sea herring and lobsters and obtain related environmental data, (2) obtain sea herring and lobster blood samples, and (3) make plankton tows for herring and lobster larvae.

FISHING OPERATIONS: Herring: Four herring trawl sets were made at the stations worked. The sets (1 hour each) made in waters of 30 to 45 fathoms yielded a total of 34 bushels (2,400 pounds). The herring caught were from 25.9 to 34.9 centimeters (about 10 to 13.7 inches) long. The 1960 year-class was dominant in the catches, followed in percentage occurrence by the 1961 and 1962 year-classes. Examination of gonadal development was made and a total of 30 blood samples was obtained and stored for analysis. Species of fish caught, other than herring were whiting (4 bushels), butterfish ($\frac{1}{2}$ bushel), yellowtail ($\frac{1}{2}$ bushel), and haddock (185 bushels). At one station, 160 bushels of haddock (over 11,000 pounds) were caught.

Lobster: A total of 17 trawl sets was made at the 3 lobster stations covered. The sets made in waters ranging in depth from 15 to 220 fathoms yielded 43 lobsters (28 females, 9 of which were berried, and 15 males). Most of the lobsters were caught at Little Georges at depths of 25 fathoms or less. Two lobsters were soft-shelled and the average weight of all lobsters caught was about $4\frac{1}{2}$ pounds. They ranged in weight from $\frac{1}{3}$ to 12 pounds. Eleven blood samples were obtained for analysis.

PLANKTON OPERATIONS: Herring: Seven 1-meter net plankton tows lasting 15 minutes each (5 minutes at 10 meters, 5 minutes at 5 meters, and 5 minutes at the surface) were made during the cruise. No herring larvae were obtained in those tows.

Lobster: Four 1-meter net plankton tows of 15 minutes each (at the surface) were made during the cruise, all without lobster larvae.

HYDROGRAPHIC OBSERVATIONS: Five sea-bed drifters and 5 drift bottles were released at hydrographic stations, and at each station bathythermograph (BT) casts were made, surface salinities collected, and weather observations recorded.

Note: See Commercial Fisheries Review, July 1965 p. 35.

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DISTRIBUTION OF ZOOPLANKTON AND LARVAL LOBSTERS IN GULF OF MAINE STUDIED:

M/V "Rorqual" Cruise 5-65 (August 14-28, 1965): To determine gross distribution of zooplankton and larval lobsters and to take environmental measurements at selected continuity stations in the coastal areas of the Gulf of Maine were the objectives of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Rorqual.

Oblique tows from 0-20 meters (65.6 feet) with the Gulf of Mexico No. III trawland surface tows with the Boothbay No. 1 trawl equipped with a special lobster net were made at each station worked.

Preliminary findings during the cruise indicated that volumes of zooplankton decreased from west to east along the Gulf of Maine coast. In the Gulf's western area, copepods dominated the zooplankton. Crustacean eggs and fish eggs dominated the catches made in the central and eastern areas. A total of 47 lobster larvae was collected, 41 of which were in the fourth developmental stage and 6 in the first stage. The heaviest concentration was found in the offing of Penobscot Bay

where 24 fourth stage larvae were captured. Heavy concentrations of "brit" size herring were observed in the Frenchman's Bayarea; no other concentrations of herring were located.

A 5-bottle (Nansen) cast, a bathythermograph (BT) cast, and a Secchi disc reading was made at each station. Five drift bottles and 5 sea-bed drifters were released at each station.



North Atlantic

FOREIGN FISHING ACTIVITY OFF COAST, SEPTEMBER 1965:

There was a slight increase in Soviet fishing activity in the North Atlantic from August to September 1965. A total of 112 vessels were sighted during September. They were identified as 51 fish factory stern trawlers, 43 side trawlers, 16 processing and refrigerated fish transports, 1 fuel and water tanker, and 1 tug. This compared with an estimated 75 vessels sighted during August 1965, and 176 vessels in September 1964.



Fig. 1 = Soviet factory stem trawler (Tropik class) alongside fish transport vessel in Northwest Atlantic.

The observations were made by the staff of the Fisheries Resource Management Office, U. S. Bureau of Commercial Fisheries, Gloucester, Mass., which conducts weekly reconnaissance flights cooperatively with the U. S. Coast Guard.

Soviet fishing operations during the month generally ranged from the Cultivator and Georges Shoals area to the "Southeast Part" of Georges Bank, 70 to 150 miles east of Cape Cod. All vessels were actively engaged in fishing operations. Moderate to heavy catches of fish observed on decks and in their trawls appeared to be primarily whiting with a small mixture of herring. In



Fig. 2 - Soviet fish transport operating in Northwest Atlantic.

many instances crews on board the large side trawlers were cutting and dressing out fish. From their size, shape, and color, those fish were believed to include substantial amounts of small haddock and mixed groundfish. The fish were bagged in sections of netting and transferred to nearby processing vessels. Similar catches were also observed on board the Soviet factory stern trawlers.

It appeared that the Soviet fishing vessels have not placed any great emphasis on fishing for herring in 1965. Up until this year, herring has been the vessels mainstay in total catch since they first arrived in the North Atlantic area in 1961.

During September there was a substantial decrease in Soviet vessels in waters adjacent to Nova Scotia, principally of the SRT and SRT-R class. That can be attributed to those vessels fishing constantly since early spring 1965 and their probable need for major repairs. Another reason may be because of the severe weather conditions that prevail in late fall.

In addition to Soviet fishing activity, 5 Polish stern trawlers and 1 side trawler, and 2 Rumanian stern trawlers were observed fishing on the Cultivator Shoals area during September. Those vessels were actively fishing and believed to be taking large quantities of small haddock.

Note: See Commercial Fisheries Review, October 1965 p. 41.



Oregon

YOUNG CHINOOK SALMON RELEASED IN EXPECTATION OF WILLAMETTE RIVER POLLUTION IMPROVEMENT:

In early September 1965, the U.S. Fish and Wildlife Service announced plans for the immediate release of one million spring chinook salmon fingerlings in the upper Clackamas

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River drainage system in the expectation that pollution in the Willamette River would subside to a safe level by October 1965 when the fish began moving downstream through Portland's critical contamination zone.

The one million young fish originally had been scheduled for release in late August 1965 from Eagle Creek National Fish Hatchery near Estacada, Oregon. But the August release was postponed because of the serious pollution problem which existed at that time in the lower Willamette River. It was feared that the young salmon would die in the oxygen-deficient water as they attempted to swim through Portland's harbor en route to the ocean. By September, however, there had been some improvement in the pollution situation and fishery scientists expected cooler weather and autumn rains to relieve the oxygen problem, thus assuring safe passage for the salmon.



Pesticides

DANGER OF CHEMICAL PESTICIDES TO MARINE LIFE UNDER STUDY:

Amazingly small amounts of pesticides can kill shrimp, crab, and other aquatic life. One part of DDT in one billion parts of water (1 p.p.b.) was found to kill blue crab in 8 days. (One part per billion is the relationship 1 ounce of chocolate syrup would bear to 10 million gallons of milk.)

Those and other new findings on the dangers of certain chemicals to wildlife are given in the 1964 annual report on pesticide research by the U.S. Fish and Wildlife Service. The purposes of the continuing study are to (1) determine the kinds and amounts of pesticides that are injurious to fish and wildlife and (2) assist in discovering ways to achieve pest control with the least hazard to fish and wildlife resources.

The researchers found that commercial brown and pink shrimp exposed to less than half of one part of heptachlor, endrin, or lindane in one billion parts of water were killed or immobilized in 48-hour laboratory tests. Those chemicals, like DDT, are chlorinated hydrocarbon insecticides. In the laboratory, paralyzed fish or shellfish may live for days, even weeks. But in the sea, where only the fittest survive, death may result almost immediately.

Under experimental conditions, the oyster detects and stores pesticides present in the water at concentrations as low as 10 parts per trillion. Pesticides stunt the growth of oyster shells. To test oyster growth, researchers filed off the thin new growth on the edge of the shells, put some oysters in water containing a pesticide, others in clean water. The results became obvious in a few days: the shells of those in clean water grew back; the others showed no perceptible growth.

The researchers found that most of the chlorinated hydrocarbons, at a concentration of 1 part per million for 4 hours, decreased plankton productivity 50 to 90 percent. Another group of pesticides, the organic phosphorous compounds, proved much less toxic.

All life forms in the sea depend on plankton which consists of microscopic plants and animals grouped by billions. Scientists fear that great kills of plankton could be caused by pesticides and not be noticed. Their absence, however, could mean the loss of an entire crop of fish dependent on them for food.

An important part of the research program seeks to learn the significance of pesticide residues. Fish and wildlife have been caught alive, and apparently healthy, which contained levels well above those considered lethal in laboratory tests. Those specimens had not taken in at any one time doses large enough to kill them. Over a long period of time, however, they had accumulated and stored the pesticides in their fat. For these specimens, a period of stress during which they would have to use their reserve of fat might prove fatal.

The research program of the U.S. Fish and Wildlife Service also seeks to compare the relative toxicity of many pesticides to fish and wildlife so that the least toxic ones can be used against pests.



Safety at Sea

EXPLOSIVE HAZARDS AT SEA:

The U. S. Coast Guard warns fishermen that both explosive and nonexplosive mines, torpedoes, and other ordnance may be present in coastal waters subject to bottom fishing operations.

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New England vessels fishing off the Virginia Capes have reported picking up non-explosive and explosive objects at the following locations: 1H4-1890, 1H4-2300, 1H4-2152, 1H4-2218, 1H5-2935, 1H5-2960, 1H5-2980, 1H5-2978.

The Coast Guard advises that nonexplosive ordnance such as practice torpedoes will normally be painted bright yellow or orange. Any such item which cannot be readily identified by sight as nonexplosive must be treated as an explosive item. If in doubt about the identity of an object, treat it as an explosive. Do not attempt to bring the object on board or alongside. If possible release the object immediately and radio the nearest Coast Guard or Navy station giving an accurate position of your vessel.

If the object cannot be released or freed by cutting fishing lines or nets, the following actions are advised: (1) Stream object as far aft as possible. (2) Notify shore station and stand by for instructions and assistance. (3) Keep crew at forward end of vessel with deck house between them and object astern. (4) Maintain steerageway as necessary to stay in area until assistance arrives.



South Atlantic Fisheries Explorations and Gear Development

CALICO SCALLOP AND SHRIMP EXPLORATIONS OFF FLORIDA EAST COAST:

M/V 'Oregon' Cruise 103 (August 16-27, 1965): A 12-day shrimp and scallop exploratory cruise off Florida's east coast was completed August 27, 1965, by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon (see map page 35).

Seasonal assessment was made of the Cape Kennedy calico scallop (Pecten gibbus) bed and shrimp trawling was conducted at night to extend exploratory fishing coverage in the 30- to 40-fathom depth range off the Florida east coast. Brown and pink shrimp (Penaeus aztecus and P. duorarum) were located in that area by the Oregon during January 1965 cruise.

CALICO SCALLOPS: A total of 54 drags lasting 30- to 45 minutes each was made

with a 6-foot tumbler dredge in depths ranging from 14 to 37 fathoms. Calico scallop catches varied from 0 to 595 pounds per drag. Catches of commercial size scallops measuring 50-60 millimeters (2.0-2.4 inches) of over 100 pounds per drag were made in the 27- to 33-fathom depth range. The most productive depths were 28 to 31 fathoms. The scallops were in prime condition and yielded 57 to 72 (average 63) meats to the pound.

About 300 pounds of small calico scallops measuring 25-35 millimeters (1.0-1.4 inches) were taken with a 40-foot flat trawl in 22 fathoms. That gear also caught commercial-size scallops (2.0-2.2 inches) up to 115 pounds per hour drag in 36 fathoms yielding 110 meats to the pound.

SHRIMP: A total of 55 drags lasting from 30 to 90 minutes each was made with 40-foot flat trawls fished on 6- and 7-foot chain doors in depths ranging from 6 to 54 fathoms. Irregular bottom was encountered from 39 to 52 fathoms. Small amounts of pink shrimp were found in 9 to 11 fathoms where catches ranged from 0 to 20 pounds of 21-25 and 26-30 (heads-on) count shrimp per drag. Incidental fish catches consisted mostly of spot (Leiostomus xanthurus), croaker (Micropogon undulatus), pinfish (Lagodon rhomboides), and filefish (Stephanolepis hispidus).

Trolling lines, maintained while steaming during daylight hours, caught 3 amberjack (Seriola dumerili), 4 little tuna (Euthynnus alletteratus), 2 dolphin (Coryphaena hippurus), 1 king mackerel (Scomberomorus cavalla), and 1 barracuda (Sphyraena barracuda).

Note: See Commercial Fisheries Review, June 1965 p. 33.



Tennessee Valley Authority

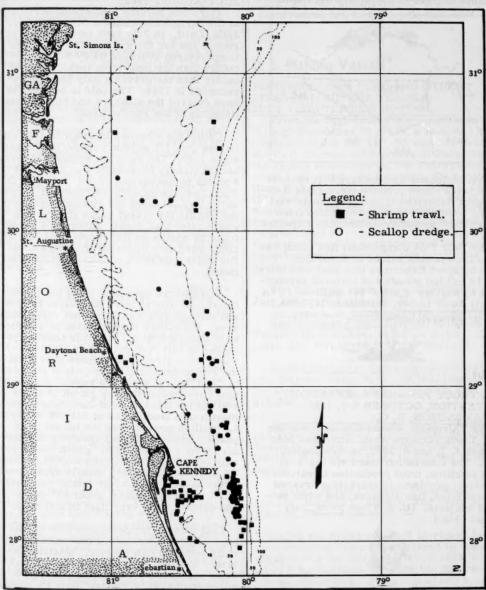
TRAWLER PURCHASED FOR COMMERCIAL "ROUGH FISH" EXPLORATIONS:

A 35-foot fishing trawler has been purchased by the Tennessee Valley Authority (TVA) for research on commercial fishing-principally for explorations in the TVA water complex and impoundments to produce "rough fish" in commercial quantities.

The vessel will be used in testing methods that could assure a large and sustained supply of "rough fish" for industrial fish markets. An assessment made several years ago of TVA reservoirs has shown a total "rough fish" population of about 61,000 tons, much of which is not being harvested. The annual "rough fish" production has been a-

bout 3,000 tons, with the belief that it could be safely increased to 30,000 tons a year.

It is estimated there is a \$9 million annual potential for commercial fishing in TVA



Area investigated off Florida's east coast during M/V Oregon cruise 103 (August 16-27, 1965).

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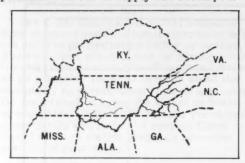
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waters if industrial fish markets can be established. Such markets include livestock and pet feed manufacturers and fertilizer producers as outlets for industrial fish if large enough quantities are available and dependable sources of supply are developed.



TVA biologists also believe that several of the lakes would produce more game fish for sport fishermen if heavier commercial fishing could reduce the competition from "rough fish" and other underutilized species.

The 1963 TVA commercial fish catch was 5.6 million pounds valued at \$2 million. The catch by sport fishermen that year was more than 16 million pounds and involved expenditures by anglers of some \$41 million. (TVA Weekly News Letter, September 16, 1965.)

Note: See Commercial Fisheries Review, March 1964 p. 28.



Trout

U. S. TROUT FARMERS ASSOCIATION CONVENTION, OCTOBER 6-8, 1965, IN WASHINGTON, D. C.:

The Thirteenth Annual Convention of the U. S. Trout Farmers Association was held October 6, 7, and 8, 1965, in Washington, D. C. The Convention heard speakers on trout nutrition, trout production in various countries, problems in marketing dressed and live trout, fish diseases, and other pertinent subjects. (U. S. Trout News, July-August 1965.)



Tuna

PACIFIC ALBACORE TUNA FISHERY AFFECTED BY ERRATIC WATER TEMPERATURE CHANGES, JULY-AUGUST 1965:

July: Sea surface temperatures recorded at the Scripps Institution of Oceanography, La Jolla, Calif., in July 1965 established a new record low for the month. The July 1965 temperatures averaged 63.0° F., or 5.1° colder than the long-term mean, and 1.4° colder than the previous July low of 64.4° F., recorded in 1944. The cold is believed to have delayed the albacore and bluefin tuna fisheries of the Pacific Coast.

California albacore landings in July 1965 totaled only 1.7 million pounds, the lowest since 1946. The southern segment of the albacore fishery apparently was delayed 3 to 4 weeks by unseasonal ocean cooling in the Point Conception offshore region in April and early May, whereas the albacore season in the Pacific Northwest began about 1 to 2 weeks later than usual. Albacore were not found by northwest fishermen until July 21, 1965, when they appeared in waters about 200 miles southwest of the Columbia River mouth.

The inshore upwelling along the Pacific Coast commenced later than usual in 1965, and through July was somewhat restricted in area. Nearshore temperatures in a narrow band along the Baja California coast were colder in July, and prevailing northwesterly winds were stronger and more persistent in the region extending from Cedros Island south to Cape San Lucas. As a result, the bluefin tuna purse-seine fishery got off to a late start in the third week of June, and California bluefin tuna landings as of July 31, 1965, of 1.5 million pounds were the lowest in 12 years. Intensified local upwelling and the occurrence of very cold, "green" water probably contributed to the poor showing of bluefin in areas where they usually appear early in the season. Guadalupe Island was situated in a band of cold water, about 630-640 F., and catches were very light in that area.

Cold inshore temperatures also appear to have induced a southward movement of typically northern fish species. Mexican fishermen took silver salmon in gill nets set for white sea bass off Pescadero Point (about 20 miles southwest of Tijuana, Baja California) in 16-18 fathoms of water on August 2, 1965.

The nets were set 2 to 3 fathoms off the bottom. Substantial catches of pink salmon were reported at Eureka, Calif., during the last week of July.

Later in the summer of 1965, Pacific coastal sea surface temperatures appeared to be warming at an above average rate.

The profound effects that rapid, short-term ocean temperature changes have on the success of fisheries for given species are just now beginning to form part of a distinguishable pattern.

August: The unusual weather and oceanographic conditions in the eastern North Pacific Ocean during July 1965 continued into August, and were followed by a reversal of coastal sea temperature deviations near midmonth. Cyclonic weather patterns prevailed in the eastern North Pacific during August, bringing about a substantial alteration in the high pressure buildup along the coast (which is normal for that time of year). The usual strong northwesterly wind flow was virtually absent until the fourth week of the month, allowing the albacore tuna commercial fishing fleet to penetrate farther offshore in northern waters.

The prevailing southwesterly flow offshore appeared to cause the eastward extension of the warm sea temperature deviation pattern first noted in July, and by month's end, warmer-than-average conditions prevailed from Vancouver Island south about 600 miles to Cape Mendocino and east of 130° W. longitude. The 60° F. isotherm generally paralleled the coastline, and appeared to remain well within 60 miles of the beach from Point Conception, Calif., all the way north to Cape Flattery, Wash.

Albacore tuna landings in southern California during July 1965 were the lowest on record, according to data tabulated since 1945. August landings failed to make up for the earlier deficit. As a result, landings to August 31, 1965, were among the lowest reported since before World War II. North coast albacore tuna fishing was variously reported as good to outstanding. Near the end of August, reports were that cold-storage facilities in the Pacific Northwest were being "swamped." Continued good weather and heavy production appeared in prospect for the Oregon coast region pointing to good

September catches of albacore tuna in that area.

Note: Ocean studies are being given renewed emphasis by the Tuna Forecasting staff of the U. S. Bureau of Commercial Fisheries. They ask that all unusual and noteworthy occurrences of fish species found outside a usual range, as well as corresponding observations of unusual sea conditions associated with them, be reported to the Tuna Resources Laboratory, U.S. Bureau of Commercial Fisheries, P.O. Box 271, La Jolla, Calif. 92038.



U. S. Fishing Vessels

FISHERIES LOAN FUND AND OTHER FINANCIAL AID FOR VESSELS, JULY 1-SEPTEMBER 30, 1965:

From the beginning of the program in 1956 through September 30, 1965, a total of 1,672 applications for \$43,143,095 was received by the U. S. Bureau of Commercial Fisheries, the agency administering the Federal Fisheries Loan Fund. By that date, 874 applications (\$19,281,779) had been approved, 555 (\$13,049,319) had been declined or found ineligible, 213 (\$8,089,892) had been withdrawn by the applicants before being processed, and 30 (\$693,968) were pending. Of the applications approved, 325 were approved for amounts less than applied for—the total reduction was \$2,028,137.

The following loans were approved from July 1 through September 30, 1965:

New England Area: Kenneth M. Ames, Tenants Harbor, Me., \$1,500; Clarke C. Chappelle, Jr., Wakefield, R. I., \$7,000.

South Atlantic and Gulf Area: Julian Brown, Jr., Marshallberg, N. C., \$8,500; Dan H. Allen and Carolyn S. Allen, Freeport, Tex., \$15,200.

Pacific Northwest Area: E. H. Jenness and Ethel B. Jenness, Bellingham, \$4,500; Edson W. Stephan, Roseburg, \$5,000; Glen Washburn, Port Angeles, \$8,000; all in Washington.

Alaska: Philip Clausen, Petersburg, \$19,408; Richard I. Eliason, and Betty M. Eliason, Sitka, \$6,000.

Under the Fishing Vessel Mortgage Insurance Program (also administered by the Bureau) during the third quarter of 1965, a total of 9 applications for \$459,403 was received. Since the program began (July 5, 1960), 86 applications were received for \$7,928,395.

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Of the total, 71 applications were approved for \$5,200,135 and 7 applications for \$1,081,715 were pending as of September 30, 1965. Since the mortgage insurance program began, applications received and approved by area are:

New England Area: Received 13 (\$1,464,500), approved 9 (\$1,034,928).

California: Received 2 (\$1,262,000), approved 2 (\$1,262,000).

South Atlantic and Gulf Area: Received 58 (\$3,266,049), approved 51 (\$2,312,137).

Pacific Northwest Area: Received 8 (\$1,861,250), approved 5 (\$526,296).

Alaska: Received 5 (\$75,596), approved 4 (64,774).

The first applications for a Fishing Vessel Construction Differential Subsidy under the Bureau's expanded program were received in December 1964. Through September 30, 1965, a total of 47 applications for \$10,398,500 had been received. Public hearings on 24 applications were completed during that period and invitations to bid for 6 vessels were sent out.

Note: See Commercial Fisheries Review, August 1965 p. 57; November 1964. p. 61.



U.S. Foreign Trade

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-September 4, 1965, amounted to 31,396,725 pounds (about 1,495,082 standard cases), according to preliminary data compiled by the U.S. Bureau of Customs. That was an increase of 19.4 percent from the 26,920,792 pounds (about 1,251,942 standard cases) imported during January 1-August 29, 1964.

The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1965 at the $12\frac{1}{2}$ percent rate of duty is limited to 66,059,400 pounds (or about 3,145,685 standard cases of 48 7-oz. cans). Any imports in excess of that quota will be dutiable at 25 percent ad valorem.



Wholesale Prices

EDIBLE FISH AND SHELLFISH, SEPTEMBER 1965:

The rising price trend for fishery products continued in September 1965. For July-September 1965, prices with few exceptions were mostly higher for a number of the major fresh and frozen fish and shellfish products, and for canned pink salmon. At 116.2 percent of the 1957-59 average, the wholesale index for edible fishery products (fresh, frozen, and canned) rose 1.7 percent from August to September 1965. Compared with September 1964, that index this September was up 5.9 percent because of substantially higher prices for large haddock, Great Lakes fresh-water fish, frozen fillets, and several canned fish products.

The subgroup index for drawn, dressed, or whole finfish was up 1.8 percent from Au-



gust to September. At New York City from August to September prices rose sharply for Great Lakes round yellow pike (up 35.7 percent) because of the Jewish Holi-

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day demand and rose slightly for western fresh salmon (up 2.7 percent). Those higher prices were partly offset by lower prices at Boston for ex-vessel large haddock (down 3.8 percent) and at Chicago for Lake Superior fresh whitefish (down 9.5 percent). As compared with September 1964, the subgroup index this September was up 5.2 percent because prices this September were up 72.6 percent for yellow pike, 28.1 percent for haddock, and 21.0 percent for whitefish. The exceptions were halibut and salmon which were down from the high September 1964 prices.

Although September 1965 prices for fresh haddock fillets at Boston rose 17.1 percent from the previous month, they were in large part cancelled out by a 7.0-percent drop in prices at New York City for South Atlantic fresh shrimp. This brought the fresh processed fish and shellfish subgroup index down by 1.4 percent. Prices for standard shucked

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Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1967-59=100)			
医			Sept. 1965	Aug. 1965	Sept. 1965	Aug. 1965	July 1965	Sept. 1964
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned) .					116.2	114,3	109,8	109,
Fresh & Frozen Hishery Products:					117.9 135.8	117,4 133,4	112.8	113.7
	Boston	1b.	18	.19	142.1	147.7	91.4	110.3
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.51	.51	150.8	149.4	147.9	162.
Salmon, king, Ige. & med., drsd., fresh or froz.	New York	lb.	.94	.91	131.0	127.5	125.8	136.
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.58	.64	85,8	94.8	87.3	70.5
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.95	.70	155.5	114.6	102.3	90.1
Processed, Fresh (Fish & Shellfish):					107,3	108,8	108.6	107
Fillets, haddock, sml., skins on, 20-lb, tins.	Boston	lb.	.48	.41	116.6	99.6	97.2	106.
Shrimp, 1ge. (26-30 count), headless, fresh	New York	1b.	.80	.86	93,7	100,8	100,8	95.4
	Norfolk	gal.	7.25	7.13	122,3	120.2	120.2	122.
Processed, Prozen (Pish & Shellfish):					105_3	104.8	106.7	100,
Fillets: Flounder, skinless, 1-lb, pkg	Boston	lb.	.40	.39	100.1	98,8	97.6	92.
Haddock, sml., skins on, 1-lb, pkg	Boston	lb.	.38	.38	111.4	111.4	108.5	108,
Ocean perch, ige., skins on 1-lb. pkg.	Boston	lb.	-31	.31	108.7	108.7	112,2	103
Shrimp, Ige, (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.86	.85	101.4	100,8	103.7	95.
Canned Fishery Products:					113,7	109,4	104,9	103.
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.).	Seattle	cs.	27,00	24,50	117.7	106.8	95.9	94,
48 cans/cs	Los Angeles	cs.	11,56	11.56	102.6	102.6	102.6	102,
	Los Angeles	cs.	7,13	7.13	120.9	120.9	120,9	105.
(3-3/4 oz.), 100 cans/cs	New York	cs.	10,00	10.25	128_3	131.5	131.5	128.

oysters at Norfolk rose 2.0 percent from August to September and were slightly higher than in September 1964. Compared with the same month a year earlier, the subgroup index was down only slightly. Prices for haddock fillets this September were higher by 9.1 percent, but were more than offset by lower prices for fresh shrimp (down 1.9 percent).

Higher prices from August to September for frozen flounder fillets (up 1.3 percent) at Boston and for frozen shrimp (up 0.6 percent) at Chicago were responsible for a 0.5-percent rise in the subgroup index for frozen processed fish and shellfish. Prices for other species of frozen fillets were unchanged from the previous month. As compared with September 1964, prices this September were higher for all items in the subgroup and the index was up 5.3 percent.

The September 1965 subgroup index for canned fishery products rose 3.9 percent from the previous month. Prices for canned pink salmon again moved up, and from August to September were higher by 10.2 percent as a result of the very low 1965 season pack. By the end of the 1965 packing season, the quantity of pink salmon packed was only about 45 percent of the previous season's output. September prices for canned Maine sardines dropped 2.4 percent from the previous month as the new season's pack moved into the market. The new season sardine pack by the end of September was 60 percent greater than the previous season's pack. As compared with September 1964, the subgroup index this September was up 10.3 percent -- prices for canned salmon were up 24.2 percent and for California jack mackerel up 14.2 percent. Prices for other canned fish were the same as in September 1964.





International

EUROPEAN ECONOMIC COMMUNITY

EUROPECHE PROPOSALS FOR A COMMON FISHERY POLICY:

EUROPECHE is an association of national fishery organizations within the European Common Market (EEC). A summary of proposals for a common fishery policy for the EEC, as reportedly presented by EUROPECHE to the Common Market Commission, was published August 13, 1965, in Dansk Fiskeritidende, a Danish fisheries periodical. Following are the main points of the EUROPECHE proposals as published in Dansk Fiskeritidende:

- (1) Fish landings and trade by EEC members should be permitted anywhere within the Common Market.
- (2) Market stabilization is the key to increasing income in fisheries.
- (3) A consistent market policy must be initiated by regulating landings in the harbors of the North Sea and the Atlantic. Those regulations should at first only include a limited number of species such as cod, coalfish, ocean perch, plaice, mackerel, fresh herring, and salted herring.
- (4) For the fish species covered by the regulations, each member country should establish intervention (minimum) prices which must not be set lower than the average of existing intervention prices in member countries or higher than the price determined by production costs. The intervention prices in different EEC countries should eventually be harmonized.
- (5) In order to maintain the intervention prices in the transitional period, national funds must be made available for equalization. Later, with equalization within the Common Market, the necessary funds must be obtained on a joint basis.

- (6) Fishermen should be pledged to observe the minimum prices established under intervention regulations.
- (7) Since the Common Market as a whole is an import area for fisheries products, it should not be closed to honmembers. But measures must be taken which will insure that imports from third countries will not cause disturbances in the Common Market.
- (8) A system of minimum "gate" prices for imports should be introduced which ought not to be less than the highest intervention prices plus 10 percent. The difference between the "gate" price and the import price would be equalized by a levy.
- (9) A clause should be introduced which would permit prohibition of imports if a fisheries market within the Common Market became subject to disturbances.

The EUROPECHE proposals are another indication that the EEC may eventually adopt a restrictive Common Market fishery policy. There is of course the precedent of the EEC agricultural policy with its intervention and gate prices. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, August 17, 1965.)

FISH MEAL

PRODUCTION AND EXPORTS FOR SELECTED COUNTRIES, JANUARY-JUNE 1965:

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Chile, Angola, Iceland, Norway, Peru, and South Africa/South-West Africa.

Peru accounted for about 74 percent of the 1,245,500 metric tons of fish meal exported by FEO countries in January-June 1965. 1

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International (Contd.):

Table 1 - Exports of Fish Meal by Member Countries

	Ju	ine	Jan	June				
Country	1965	1964	1965	1964				
	(1,000 Metric Tons)							
Chile	3.9	10.5	50.3	72.6				
Angola	1/	5.3	1/21.3	29.2				
Iceland	6.8	5.3	49.5	53.0				
Norway	19.2	13.6	92.7	109.0				
Peru	133.4	106.4	919.3	771.4				
SW. Africa)	22.7	16.7	112.4	106.9				
Total	186.0	157.8	1,245.5	1,142.1				

Table 2 - Production of Fish Meal by Member Countries of the FEO, Jan.-June 1965

	Ju	ne	Jan	fune				
Country	1965	1964	1965	1964				
	(1,000 Metric Tons)							
Chile	3.5	15.7	44.9	91.0				
Angola	1/	5.8	1/17.2	30.6				
Iceland	19.4	17.2	53.7	52.9				
Norway	36.6	13.8	143.6	99.8				
Peru	94.1	91.9	880.2	869.6				
So. Africa (including	1777		135.01					
SW. Africa)	43.1	29.2	192.3	159.2				
Total	196.7	173.6	1,331.9	1,303.1				

WORLD PRODUCTION, JUNE 1965 WITH COMPARISONS:

World fish meal production in June 1965 showed only a small increase over the previ-

	Ju		JanJune					
Country	1965	1964	1965	1964				
	(Metric Tons)							
Canada	7,025	5,533	36,512	21,934				
Denmark	12,854	11,776	55,213	41,850				
France	1,100	1,100	6,600	6,600				
German Fed. Repub.	4,795	5,727	31,645	37,277				
Netherlands	449	600	2,857	3,500				
Spain	1/	1/	2/13,247	1/				
Sweden	400	-238	4,369	3,666				
United Kingdom	5,934	6,471	40,573	40,283				
United States	41,364	44,400	3/79,835	3/87,662				
Angola	3,513	5,795	20,755	30,542				
Iceland	19,355	17,210	53,679	52,871				
Norway	36,627	13,787	143,636	99,83				
Peru	94,104	91,904	880,219	869,683				
So. Afr. (including			1 1 15 1 14	NO KAT				
SW. Afr.)	42,519	29,316	193,317	159,593				
Belgium	375	375	2,250	2,250				
Chile	3,547	15,727	44,914	90,986				
Morocco	1/	2,700	1,100	6,760				

Data not available. Data available only for January-May 1965. Ravised.

ous month. A decline in Peruvian output almost offset higher production in the United States, Canada, Denmark, Iceland, Norway, South Africa, and Angola.

World fish meal production in January-June 1965 was up about 3.5 percent from that in the first 6 months of 1964. Peru accounted for about 55 percent of total output in January-June 1965. Most of the principal countries producing fish meal submit data to the International Association of Fish Meal Manufacturers monthly (see table).

INTERNATIONAL PACIFIC HALIBUT COMMISSION

CLOSURE OF PACIFIC HALIBUT FISHING IN AREAS 1, 2, 3A, AND 3B SOUTH:

Fishing in Pacific halibut Areas 2 and 1 ended at 6 p.m. (P.S.T.) on September 15, 1965, the mandatory date of closure. Announcement of the closure to fishing in those areas was made by the International Pacific Halibut Commission since it estimated that the catch limit of 23 million pounds in Area 2 would be reached by that date. There was no catch limit in Area 1 which was scheduled to close at the same time as Area 2.

The Commission previously announced the end of fishing in Area 3A at 6:00 p.m. (P.S.T.)

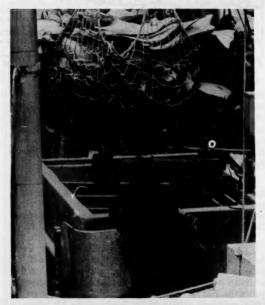


Fig. 1 - Fresh halibut being unloaded with a cargo net from the hold of a halibut fishing vessel at Seattle, Wash.

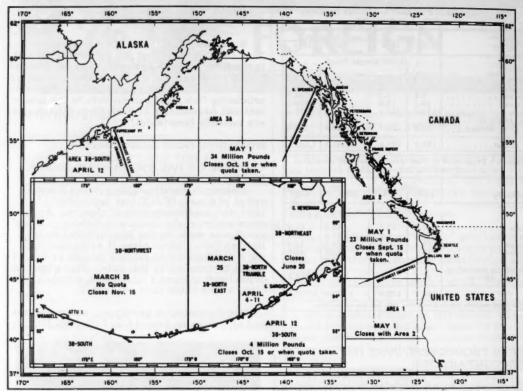


Fig. 2 - International Pacific Halibut Commission chart showing 1965 regulatory areas, opening dates, quotas, and closing dates.

on August 26, 1965, when it was estimated that the area's 34-million-pound quota for the 1965 season would be attained. There will be no halibut fishing in those areas until they are reopened in 1966. In 1964 fishing in Area 3A ended on August 19 when the same catch quota was attained.

Area 2 extends from Willapa Bay to Cape Spencer, Alaska; Area 1 includes the waters south of Willapa Bay, Wash.; Area 3A includes waters off the coast of Alaska between Cape Spencer and the Shumagin Islands.

The catch quota of 23 million pounds in Area 2 is 2 million pounds less than last year's quota of 25 million pounds, and is 5 million pounds less than the 28-million-pound quota in 1963. The catch limit in Area 2 in 1964 was not attained by September 15 when

the season closed. The final catch in that area in 1964 was about 5 million pounds less than the quota.

Halibut fishing season in Area 3B South was scheduled to end at 6 p.m. (P.S.T.) on September 30, 1965, at which time the catch limit of 4 million pounds was estimated would have been attained, announced the International Pacific Halibut Commission on September 9. There will be no halibut fishing in that area until reopened in 1966. Area 3B South includes the waters west of Area 3A, not including the Bering Sea. In 1964, halibut fishing in area 3B South ended on October 15, the mandatory date of closure for that area and the catch limit was the same as this year.

Halibut fishing in the new Area 3B Northwest, which opened on March 25, 1965, with-

out catch limit, remained open to fishing until November 15. In 1965, that area formerly designated as Area 3B North was divided into 2 areas-3B Northwest and 3B Northeast. Area 3B Northeast (also without catch limit) closed on June 20, 1965. Last year fishing in the area designated as 3B North ended on October 15.

Landings by both United States and Canadian fishermen of Pacific halibut from the regulated areas through August 1965 totaled 56.3 million pounds, about 1 million pounds more than the previous year during the same period. Of this year's landings, 26.9 million pounds were by U. S. fishermen and 29.4 million by Canadian fishermen.

INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

SOCKEYE AND PINK SALMON FISHERY TRENDS IN CONVENTION WATERS, EARLY SEPTEMBER 1965:

Pink and sockeye salmon fisheries off the northwest coast of North America under the Sockeye Salmon Fisheries Convention (as amended by the Pink Salmon Protocol) are regulated by the International Pacific Salmon Fisheries Commission (IPSFC). The Commission sets fishing time so as to provide for adequate escapement and equal division of the catch between the fishermen of Canada and the United States.

The 1965 season was marked by a pink salmon run which fell far below expectations. The sockeye fishery yielded the forecast modest returns of a light cycle year.

The pink salmon catch in Convention waters as of September 15, 1965, amounted to only 533,260 fish for the United States and 464,341 for Canada. That was far below the pink catch of 4,284,992 fish by United States fishermen and 3,892,823 by the Canadians during the same period of 1963, which was the previous pink cycle year.

The sockeye salmon catch as of September 15, 1965, in Convention waters was about equally divided--United States fishermen had taken 1,024,735 fish and the Canadians 1,024,422. That compares with sockeye catch-

es of 1,376,501 and 1,353,472 fish, respectively, during the same period of 1961, the previous sockeye cycle year.

By early September 1965, it appeared that the sockeye fishery in Convention waters was about over for the season. The pink fishery was also declining as the fish moved toward the spawning grounds. Test fishing indicated a fair escapement of Fraser River pinks into the Georgia Strait area during early September. In August, the Commission had found it necessary to restrict fishing in order to provide for adequate escapement of pink salmon to the Fraser River since that run was considerably below the forecast of 6.5 million fish. (Information Bulletins, International Pacific Salmon Fisheries Commission.)

Note: See Commercial Fisheries Review, Sept. 1965 p. 51.

INTERNATIONAL LABOR ORGANIZATION

FISHERMEN'S TRAINING AND WORKING CONDITIONS TO BE REVIEWED:

A Preparatory Technical Conference on Fishermen's Questions was scheduled to meet in Geneva, Switzerland, October 18-29, 1965, under the sponsorship of the International Labor Organization. The agenda for the conference covered: (1) accommodations on board fishing vessels, (2) vocational training of fishermen, and (3) rules governing fishermen's certificates of competency.

Paul Hall, President of the Seafarers International Union of North America (AFL-CIO), was nominated to attend the conference as a United States labor delegate. The delegation of each attending nation was to include representatives of management and government as well as labor. (The American Fisherman and Cannery Worker, September 1965.)

Note: See Commercial Fisheries Review, March 1963 p. 40.

MARINE OIL

WORLD PRODUCTION AND EXPORTS, 1960-1964 AND FORECAST 1965:

World exports of marine oils in 1965 are expected to decline for the third consecutive year because of the further reduction in baleen whale oil supplies and the decline in sperm oil supplies.

World production of fish oil in 1965 could increase, but there is little indication that any sizable increase in output will occur. Production of herring oil in Norway and Denmark showed an expansion in the early months of

World Marine Oil Production	on and Export	s 1/, Average	1955-59, An	nual 1960-19	64, Forecast	1965	111-200
Item	Forecast 1965	2/1964	1963	1962	1961	1960	Average 1955-59
			(1,0	000 Short Ton	s)		
Production: Baleen whale oil Sperm whale oil Fish and fish-liver oil	210 155 740	249 172 710	295 149 655	390 130 750	428 120 669	418 122 511	427 119 428
Total marine oil production	1,105	1, 131	1,099	1,270	1,217	1,051	974
Exports: Baleen whale oil Sperm whale oil Fish and fish-liver oil	210 155 440	249 172 407	295 149 405	390 130 386	428 120 295	418 122 245	427 119 160
Total marine oil exports	805	828	849	906	843	785	706

1/Exports from producing countries.

2/Preliminary.

Note: Data are estimates based on official statistics of foreign governments, other foreign source materials, reports of U. S. Agricultural Attaches and Foreign Service Officers, and other sources.

1965 as did production of anchovy oil in Peru. But Peruvian anchovy fishing was poor in July and closed in August in 1965. The fish oil situation will depend mainly upon fishing conditions in the fall for Peru and in the summer for the United States. United States production of menhaden oil through June 1965 (33,690 metric tons) was disappointing.

World exportable supplies of fish oil may be somewhat larger in 1965 than in the previous year. Exports from a number of countries, including Peru, Iceland, Chile, and Denmark increased in the early months of 1965 from the same period a year earlier. (Editor's Note: Peruvian exports of fish oil in the first half of 1965 were reported to total 86,200 metric tons as compared to 69,000 tons in January-June 1964. But United States exports of fish oil in the first half of 1965 totaled only 13,685 metric tons as compared with 25,464 tons in the same period of the previous year.) Production of fish oil in the latter half of 1965 will have an important bearing on available supplies because carryover stocks at the start of the year were at a low level in most exporting countries, other than Peru and Iceland. (U. S. Department of Agriculture, World Agriculture Production and Trade, August 1965.)

SALMON

BALTIC SEA CONSERVATION AGREEMENT BETWEEN DENMARK, SWEDEN, AND WEST GERMANY:

A Baltic Sea salmon conservation agreement involving Denmark, Sweden, and West Germany was expected to go into effect in the fall of 1965. Approval of the tripartite

agreement by the West German Forbundsdag was reported in September 1965. Denmark and Sweden approved it much earlier. The agreement becomes effective 2 months after deposition of the ratifying documents with the Government of Sweden.

Copies of the agreement are not yet available but it is reported to provide for:

- (1) A minimum mesh size in drift gill nets of 165 mm. (6.5 inches) for natural fibers and 157 mm. (6.2 inches) for synthetic fibers, with a 5-year transition period for gear currently in use.
- (2) A minimum width of 19 mm, (0.748 inches) between the point and shaft of hooks used in the long-line fishery.
- (3) A minimum size of 60 cm. (23.6 inches) for salmon, measured from the tip of the snout to the extreme end of the tail.

Danish, Swedish, West German, and Polish fishermen's representatives also have been discussing institution of a closed salmonseason in the Baltic from December 20 to February 10. A closed season in summer also has been suggested but no dates have been agreed upon.

Danish fishermen now are using mostly drift gill nets instead of long lines because of better catches with the fine nylon gear. Midwater trawls may be used legally by East Germans, but not by Swedish, Danish, or Polish fishermen.

The Danish salmon catch in 1964 totaled 1,455 metric tons with an ex-vessel value of 20 t Sea.

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26.4 million kroner (US\$3.8 million). All but 20 tons of that catch was taken in the Baltic Sea. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, September 15, 1965.)

Note: See Commercial Fisheries Review, Jan. 1963 p. 87.

WHALING

5-NATION TOKYO CONFERENCE ENDS WITHOUT AGREEMENT:

The 5-nation (Japan, Norway, Soviet Union, Great Britain, and the Netherlands) whaling conference, convened at Tokyo, September 1, 1965. It ended on September 7 without agreement being reached on the allocation of the international whale catch quota or the implementation of the observer system. (Suisan Keizai Shimbun, September 8, 1965.) Note: See Commercial Fisheries Review, October 1965 p. 66.



Angola

FISHERY TRENDS IN 1965:

Floating Laboratory: A new floating laboratory to be used in fishery research was launched in Lobito, Angola, July 30, 1965. The laboratory-vessel, named the Goa, was built at a cost of 21,000 contos (about US\$735,000) and will be used by the Angolan Fishing Institute in research connected with the fishing industry. Specifications are: length 120 feet; displacement 10.4 feet; average speed 12 knots; and cruising range 5,000 miles.

Fish Meal Plant: The construction of a new fish meal and oil plant in Benguela has been completed, according to an August 8. 1965, Angolan press report. The plant is said to be almost completely automated and has a processing capacity of 12 tons of fish an hour. The cost of the plant, which was financed by

local capital, was placed at US\$350,000. (United States Consulate, Luanda, August 13, 1965.)

FISHERY LANDINGS PRODUCTION

AND EXPORT TRENDS, 1963-1964: In 1964, fishery landings at Angola's 4 principal fishery ports (see table 1) totaled 355,810 metric tons with an ex-vessel value of 220,947 contos (US\$7.7 million). That was a gain of 61 percent in quantity and 44 percent in value over the previous year.



Most of Angola's fishery landings go for reduction into meal and oil. Angola's fish meal production increased from 32,798 tons in 1963 to 54,660 tons in 1964, while fish oil

Tabl	e 1 - Angola's l	ishery Landings	at Principal Por	rts, 1963-1964			
Ports	Qua	ntity	Value				
rorts	1964	1963	19	064	19	1963	
	(Metric Tons)		Contos	US\$1,000	Contos	US\$1,000	
uanda	33, 237	26,439	25, 182	877.7	24,739	862.3	
obito	156, 247	92,957	116,699	4,067.6	67,082	2,338.2	
focamedes	165, 284	119, 396	71,898	2,506.0	54, 291	1,892.3	
anto Antonio do Zaire	1,042	1,055	7,168	249.9	7,220	251.6	
Total	355, 810	239, 847	220,947	7,701.2	153, 332	5,344.4	

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Angola (Contd.):



Pulling fish trap off Equimina, Angola.

output increased from 3,579 tons to 7,435 tons. The production of dried fish and the limited output of canned fish showed little change from 1963 to 1964. Exports absorb almost all of Angola's production of fish meal, fish oil, and canned fish, as well as much of the production of dried fish.

Princ	Table			duction of ucts, 196			
Product		1964		1963			
	Quantity	Va	lue	Quantity	Value		
	Metric Tons	Contos	US\$ 1,000	Metric Tons	Contos	US\$ 1,000	
Fish meal Fish oil Dried fish Canned fish	54,660 7,435 18,871 1,741	21,460	2, 127.1	3,579 19,143	8, 116	3,359.4 282.9 2,700.6 939.0	

Product	1	1964			1963				
Product	Quantity	Va	lue	Quantity	Quantity Val				
Fish meal Fish oil Dried fish Canned fish	Metric Tons 54,434 7,379 11,875 1,855	Contos 176,982 24,223 69,153 26,240	2,410.3	3, 122 11, 354	Contos 86,753 7,845 66,135 27,330	2,305.2			

A \$1.4-million project to modernize Angola's fish meal industry was reported in early 1965. Angola newspapers indicated that the Portuguese Development Bank would provide a loan of about \$500,000 to help finance the project. (Relatório e Contas do Banco de Angola, 1964.)

Note: See Commercial Fisheries Review, June 1965 pp. 40 & 45.



Australia

TUNA SURVEY UNDER WAY IN NORTHERN WATERS:

The yellowfin tuna survey off Great Barrier Reef in the Coral Sea, planned jointly by the Australian Federal and State of Queensland Governments, began in early August 1965.

The South Australian tuna fishing vessel Degei was chartered for the survey and is working in cooperation with an airplane hired from a Sydney aircraft firm.

Plans were to use the plane to spot tuna shoals, and a supporting fishing vessel to catch and identify the fish. (Australian Fisheries Newsletter, September 1965.)

Note: See Commercial Fisheries Review, October 1965 p. 66.

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WESTERN AUSTRALIAN 1965 SHRIMP LANDINGS DOWN FROM PREVIOUS SEASON:

Shrimp landings for the 1965 season in Shark Bay, Western Australia, will be down about 500,000 pounds or 25 percent below the previous season's landings, according to preliminary estimates.

The season this year started late and by the end of May landings of king and tiger shrimp were down 52 percent. Landings improved between May and July but they were still down 21 percent from the same time a year earlier.

Shrimp landings in Exmouth Bay were also reported less than the previous year but did not drop as much as in Shark Bay. (Australian Fisheries Newsletter, September 1965.)

* * * * *

SHRIMP SURVEY OFF NEW GUINEA SHOWS COMMERCIAL POTENTIAL:

Promising catches of shrimp were reported from Madang, in New Guinea. A 14-foot outboard motor launch, operated by the Australian Federal Government Fisheries Division, caught 56 pounds of banana (Penaeus merguiensis) and giant tiger (Penaeus esculentus) shrimp one mile east of the Ramu River, near Madang.

Australia (Contd.):

The shrimp were caught during a 10-day survey carried out between Madang and Wewak. The catch shows that there are commercial possibilities for shrimp trawling in that area, the chief of the Fisheries Division said.

The survey was to be continued after overhaul of the research vessel. (Australian Fisheries Newsletter, September 1965.)

SHRIMP IMPORTS SOAR TO MEET HOME DEMAND:

Australia imports a large quantity of shrimp, principally from India, Japan, and Hong Kong, in order to meet an acute domestic shortage. Restaurants, clubs, and other institutions in Sydney need large quantities of shrimp for their popular seafood dishes, including a wide range of Chinese meals, and are forced to rely more and more on imports.

India, the main supplier of peeled shrimp, in a 9-month period shipped to Australia 700,000 pounds. It is believed that India will eventually sell Australia 2 million pounds of shrimp a year. This will help fill the gap in supplies for the domestic demand since Australia exports a good part of her shrimp production to Japan, France, and the United States.

There is an Australian tariff of 1 shilling (11 U.S. cents) a pound on imported shrimp which is meant to protect the Australian fishermen. Public opinion is that this has resulted in higher prices and a greater scarcity of shrimp. Australia's largest shrimp distributor said, "The demand is insatiable and everyone wants shrimp." He said the type of shrimp in greater demand by Sydney housewives was peeled small "school" shrimp. Large shrimp were not as scarce and usually went to hotels, restaurants, and clubs.

Australian shrimp importers are forced to compete with United States, Japanese, and French buyers for India-produced shrimp, and pay 11 cents a pound import duty on what they are able to import.

There is a scarcity of good quality small shrimp for the home market because Australian fishermen concentrate on fishing for larger sizes (king, tiger, and banana shrimp), which bring bigger returns from the export trade. Indian and Chinese fishermen, however, who do not have large fishing craft and mechanized equipment to fish in deep water where the large shrimp are found, fish for small shrimp only. (Fish Trades Review, July 1965.)

IMPORTS OF MARINE PRODUCTS, 1963/64 AND 1964/65:

In fiscal year 1964/65 (July-June), Australian imports of edible fishery products

* * * * *

14		1964/65			1963/64	
Item	Quantity	Va	lue	Quantity	Va	llue
dible Fish and Shellfish:	1,000 Lbs.	AL 1,000	US\$ 1,000	1,000 Lbs.	AL 1,000	US\$ 1,000
Frozen: Fish fillets Other fish Shellfish	34,518 3,295 2,788	4,362 361 717	9,684 801 1,592	34,976 3,013 2,188	4,283 300 609	9,508 666 1,352
Canned: Herring. Salmon. Sardines and sardine-like fish Tuna.	4,768 11,912 6,341 316	530 3,114 1,001 45	1,177 6,913 2,222 100	4,376 11,641 6,494 497	467 2,737 984 74 132	1,037 6,076 2,184 164 293
Other fish	1,580 1,383 9,693	230 378 1,296	511 839 2,877	1, 191 887 10, 687	290 1,221	2,71
Total edible fish and shellfish	76,594	12,034	26,716	75,950	11,097	24, 635
ndustrial Products:	24,657	633	1,405	18,671	434	963
Other Marine Products: Cultured pearls	1/1/	539 851	1, 197 1, 889	1/1/	323 465	717 1,032

Australia (Contd.):

totaled 76.6 million pounds with a value of US\$26.7 million--a gain of 1 percent in quantity and 8 percent in value over the previous year. Canned fish and frozen fish fillets continued to be the main items among the edible fishery imports.

In fiscal year 1964/65, imports were somewhat higher for all the main canned items except tuna and sardines. Frozen shellfish imports were also up, but there was a slight decline inimports of frozen fish fillets. (The decline was in the 1-pound pack of fillets--down from 12,090,000 pounds to 11,128,000 pounds; imports of the larger packs of fillets rose from 22,886,000 pounds in fiscal 1963/64 to 23,390,000 pounds in 1964/65.) Higher prices for imported fish fillets helped raise the value of the edible imports in 1964/65 to a record level.

Imports of fish meal were up in 1964/65, and the value of imports of cultured pearls and other marine products was also higher. (Australian Fisheries Newsletter, September 1965.)

Note: See Commercial Fisheries Review, April 1965 p. 55.

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EXPORTS AND PRODUCTION OF SPINY LOBSTERS AND TRENDS, FISCAL YEAR 1964/65:

A 17-percent drop in Australian exports of spiny lobster tails in fiscal year 1964/65 and a 56-percent drop in exports of whole spiny lobster point to a further decline in total Australian spiny lobster production-most of it in Western Australia. Spiny lobster fishing is Australia's biggest fishery and nearly all the catch is exported.

In 1964/65 (July 1-June 30), exports of spiny lobster tails dropped by 1,638,000 pounds and exports of whole spiny lobster dropped by 741,000 pounds as compared with 1963/64--the equivalent of about 5 million pounds live-weight basis. These data appeared in the publication Trends in Australian Marine Export Markets by the Fisheries Branch of the Department of Primary Industry.

Final production data for 1964/65 are not complete, but export figures indicate a decline in total Australian production of between 1 million and 2 million pounds live weight when allowance is made for an unusually heavy carryover of export tails and whole lobster

into the first month of the 1965/66 fiscal year.

Australian spiny lobster production in 1963/64 was 27.6 million pounds (live weight), of which Western Australia accounted for 18 million pounds, a drop of 3.4 million pounds from the previous year's record catch.

In 1964/65 exports of spiny lobster tails from Western Australia were down about 2 million pounds and exports of whole lobster were down 475,000 pounds from 1963/64.

Although the quantity of tails and whole lobster exports dropped in 1964/65, the value rose to a record US\$15.8 million due to the strong United States market and a worldwide increase in demand.

Imports of spiny lobster tails account for the bulk of the United States supply, but during the first 6 months of 1965 United States imports were 2 million pounds below those for the same period in 1964. This resulted in the highest prices on record for spiny lobster tails sold in the United States market.

Australia ranks second in the world as a supplier of spiny lobster tails to the United States market. But if Australia is to takefull advantage of this valuable market, annual production must be maintained on a continuing basis at the highest possible level. (Australian Fisheries Newsletter, September 1965.)

Note: See Commercial Fisheries Review, January 1965 p. 61.

ABALONE FISHERY TRENDS:

In the first four months of 1965, 90,000 pounds (meats) of abalone was taken from Tasmanian waters. This was worth about US\$24,600 to the fishermen. In 1964, the total abalone catch was 24,119 pounds (meats) valued at \$5,600, which was nearly half the total Australian catch. The number of divers operating varied from 17 to 11.

The Tasmanian Minister for Fisheries has warned that claims that a large abalone industry could be developed were not supported by Government fisheries officers. Although the extent of stocks was not yet known, it was doubtful if the industry could support more than 30 full-time divers. Most of the Tasmanian catch of abalone is being canned by a cannery in Queensland, and some is processed in Victoria and New South Wales.

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Australia (Contd.):

(Australian Fisheries Newsletter, September 1965.)

Note: See Commercial Fisheries Review, April 1965 p. 59.



Brazil

SPINY LOBSTER PRODUCTION AND EXPORTS LOWER:

The declining trend of spiny lobster production in northeastern Brazil continued into 1965, with Ceará's lobster fishermen reporting catches less than two-thirds of "normal." As a result, exports of frozen lobster tails from the ports of Recife, Fortaleza, Natal, and São Luiz, dropped from a high of 2,000 metric tons in 1962 to 1,770 tons in 1963, and 1,577 tons in 1964, with a further decline expected for this year. The smaller catch is attributed to overfishing and to exceptional rainfall which has muddied lobster banks located on Brazil's Continental Shelf.

While lobster production and exports have been declining, that region has increased its landings of red snapper from 208 tons in 1962 to 1,050 tons in 1964. Further increases in the red snapper catch are expected as new fishing banks are discovered and export markets develop. (United States Consulate, Recife, September 3, 1965.)

MEXICAN VESSELS BOUGHT FOR FISHERIES VENTURE:

A Brazilian animal feed producer plans to diversify by setting up a fish-processing plant at the port of Belem in northeast Brazil. The new plant is to process fish for export as well as for domestic use. Shrimp, lobster, salted fish, and fish meal are some of the items considered for production.

Three 72-foot steel trawlers for the Brazilian firm are being built in Mazatlan, Mexico. One of the vessels will carry radar and freezing equipment. All will have some refrigeration.

"Bacalao" (salt-cod) is popular in Brazil. A representative of the Brazilian firm wishes to arrange for some of the vessels fishing for cod in the North Atlantic to land their catches in Brazil for processing at Belem.

As an alternative, the firm is interested in finding a substitute for "bacalao" such as, for example, the shark fillets produced in Mexico. (United States Embassy, Mexico, D.F., September 4, 1965.)



British Guiana

SHRIMP FISHERY TRENDS:

The shrimp fishery is the dominant and most rapidly expanding fishing activity in British Guiana. Spurred by favorable operating conditions and proximity to rich shrimp grounds, the industry has expanded from a small beginning in 1959 when 9,748 pounds of



Fig. 1 - Shrimp fishing vessels at a processing firm's dock, Georgetown, British Guiana.



Fig. 2 - A shrimp-processing firm's vessel dock in Georgetown. Net lockers and spare parts storeroom at left.

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British Guiana (Contd.):

shrimp were landed to a record production of 6 million pounds landed in 1964. The number of shrimp vessels operating out of British Guiana from the port of Georgetown has increased from 60 in 1962 to 84 in early 1964 to 107 in 1965. A United States-owned firm in Georgetown that operates about 75 of the shrimp vessels has completed new docking facilities and a new packing and freezing plant with a reported capacity of about 80,000 pounds daily. Most of the production of the local shrimp industry is exported frozen to the United States.



Fig. 3 - Ice-making plant, and unloading and shipping dock of a shrimp-processing firm in Georgetown.



Fig. 4 - Freezing plant and dock of another shrimp-processing firm in Georgetown.

Several trawlers operated by a local firm and numerous small fishing boats are engaged in catching fish for local consumption, but their production is insufficient to supply the local market. Consequently fish imports have been rising in recent years and are now valued at US\$2.6 million a year. (United States Consulate, Georgetown, August 15, 1965.)



Burma

FISHERIES TRADE PLACED UNDER GOVERNMENT CONTROL:

The Government of Burma has declared 18 kinds of common fishery products to be essential commodities. This means that only the Government can buy, sell, store, or transport those items. The order announcing Government control over essential fishery products also provided that the Government may set prices for "nonessential" fishery products. (United States Embassy, Rangoon, September 3, 1965.)



Canada

DEPARTMENT OF FISHERIES REORGANIZED:

Expansion and reorganization of Canada's Department of Fisheries so that it can more effectively carry out its responsibilities in the light of expanding fishing activity by Canada and other fishing nations of the world was announced by the Fisheries Minister, August 26. 1965.

The Fisheries Minister said, "It is the objective of the Department through fisheries development programs, integrated with those of the provinces, to exploit resources to a safe maximum, including those species which we have overlooked in the past; to improve techniques of harvesting these resources; and to further increase the quality of our products so there will be an increased demand for them both at home and abroad."

"Changes in the Department's structure," he said, "also result from stepped up scientific and technical programs, and the international aspects of Canada's fisheries involving her participation on seven different international fisheries commissions which are becoming more and more important in the proper conservation and management of the fishery resources of the high seas."

Canada (Contd.):

"The Civil Service Commission has already made some appointments within the new structure," he added. Under A.W.H. Needler, Deputy Minister, there will be two Assistant Deputy Ministers. S.V. Ozere, Assistant Deputy Minister, is assuming responsibility for the Department's International and Jurisdictional Affairs. W. M. Sprules becomes Director of the International Fisheries Service under Ozere

R. R. Logie of Halifax, N.S., who headed the Fish Culture Development Branch of the Department in the Maritimes Area has been appointed Assistant Deputy Minister (Operations) effective September 1, 1965. He will have under his direct supervision the activities concerned with conservation, protection, resource development, and inspection, as well as the administration of other special programs such as the Fishermen's Indemnity Plan and the Newfoundland Bait Service.

I. S. McArthur, Chairman of the Fisheries Prices Support Board, has been appointed Director-General of Economic Services and will have general responsibility for directing and coordinating all economic responsibilities and activities in the field of fisheries. W. C. MacKenzie will be Director of the Economic Research and Intelligence Service. A new service of Planning and Policy Analysis also comes into being under McArthur. This service will analyze and evaluate the economic potential of the fishing industry and work out broad development plans on a regional basis in cooperation with the provinces and industry.

As part of the reorganization, the Department's Conservation and Development Service will be divided into two services. They will be the Conservation and Protection Service which will be responsible for the administration and operation of programs designed to protect and maintain fish stocks through regulations, and the Resource Development Service which will be responsible for the application of modern techniques designed to expand stocks of fish.

A. L. Pritchard, Director of the Conservation and Development Service, will maintain his present duties until the reorganization is complete and will then be given special and important duties associated with the conservation of the resource.

"Further changes in organization embracing other activities of the Department will be announced at a later date," the Fisheries Minister said.

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1965 COHO SALMON GRILSE TAGGING PROGRAM AT

GEORGIA STRAIT-DISCOVERY PASSAGE:

A coho salmon grilse tagging program in the northern Georgia Strait and Discovery Passage areas was carried out from mid-September to early November 1965 by the Canadian Department of Fisheries. This was the second tagging program to be conducted in the Georgia Strait region during 1965 for determining the timing and subsequent distribution of a juvenile coho population which demonstrates a mass movement through Johnstone Strait during the fall of each year.

The tagging was carried out on board the drum-seiner Naughty Lady, and began in the Strait south of Campbell River. During the remainder of the program, additional tagging and a tag recovery operation was conducted in Discovery Passage.

Because of the immature stage of the salmon, few tags will be recovered during the 1965 fishing season but those fish will be entering the fishery during the 1966 season. The Canadian Government asks that both commercial and sport fishermen cooperate, as they have done in the past, by returning their tags together with the pertinent recovery information to the Canadian Department of Fisheries, 1155 Robson St., Vancouver 5, B.C., or to the fishery officer in their area. To facilitate the return of tags, sport fishermen are advised that special postage-free tag-return envelopes will be available during the 1966 season at most boat rental and moorage facilities. A nominal reward of 50 cents is offered for the return of each tag and recovery information. (Canadian Department of Fisheries, Vancouver, B.C., September 7, Note: See Commercial Fisheries Review, February 1965 p. 67.

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SALMON FISHWAY BEING BUILT AT MEZIADIN FALLS IN BRITISH COLUMBIA:

A \$700,000 fishway on the Meziadin River in northern British Columbia was scheduled for completion by mid-summer 1966 under a contract awarded by the Canadian Department of

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Canada (Contd.):

Fisheries. The fishway will enable migrating adult salmon to bypass dangerous Meziadin Falls.

Meziadin River is the largest sockeye salmon-producing stream of the Nass River system and, as such, ranks among the best sockeye rivers on the British Columbia coast north of the Fraser River. The fishway will significantly increase the numbers of healthy spawners reaching upstream sections of the river. This will increase production of young fish and add to the numbers of sockeye salmon available to the commercial risheries of the area. (Canadian Department of Fisheries, Ottawa, September 2, 1965.)

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SALMON FISHING LICENSE CHANGES PROPOSED TO REDUCE FISHING PRESSURE:

Agreement has been reached with representatives of British Columbia fishery organizations on some preliminary steps that might be taken toward controlling the intensity of commercial salmon fishing operations on the Pacific Coast, Canada's Deputy Minister of Fisheries announced September 3, 1965. "Progressive intensification of salmon fishing would ultimately make it impossible for the Department of Fisheries to discharge its responsibility adequately in the conservation of the important salmon stocks," he said.

At a meeting in Vancouver, B.C., between Government and industry representatives there was a discussion of tentative Government proposals to regulate the issuance of salmon fishing licenses. "As a result, it is now planned to modify the proposed procedure for licensing fishermen and to introduce registration of fishing craft. Proposals for a special permit, with a graduated fee structure, for entry into the salmon fisheries were also discussed, but it was agreed that further consideration of this matter was necessary. A second meeting on these and other aspects of the problem will be held later this year or early in 1966," the Deputy Minister of Fisheries said. (Canadian Department of Fisheries, Ottawa, September 3, 1965.)

NEW ATLANTIC SALMON REARING STATION PLANNED FOR NOVA SCOTIA:

The immediate construction of a modern Atlantic salmon rearing station at Margaree

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on Ingram Brook, Inverness County, Nova Scotia, so that it will be in operation in fall 1965, was announced August 26, 1965, by Canada's Fisheries Minister.

The new station will serve a double purpose for Nova Scotia and New Brunswick salmon runs. It will replace the present fish-culture facilities at Margaree, which have been in continuous operation for years and are worn out. It will also serve as an experimental prototype for the incorporation of advanced techniques in the artificial propagation of salmon which will be used to maintain the salmon population of the Saint John River following completion of the Mactaquac hydroelectric project on that waterway.

The propagation methods to be used at the new station have proved to be highly successful in Sweden, where they were studied in 1964 by senior technical officers of the Canadian Department of Fisheries. Many features of the Swedish method are considered to be readily adaptable to the situation which will develop on the Saint John River at Mactaguac after 1967, when the hydroelectric project is to be completed. Before full-scale facilities are built at Mactaquac, it was decided that a scale prototype, with modifications to make the system more adaptable to the Canadian environment, should be built at Margaree. That decision was made in the interest of economy because the fish-culture facilities at Margaree need replacement rather than repair. (Canadian Department of Fisheries, Ottawa, August 26, 1965.)

SALMON SALES TO

SOUTH AFRICA INCREASING:

Prosperity in the South Africa Republic is boosting Canadian sales of canned salmon in that area. The South Africa Republic increased its imports of Canadian canned salmon from 71,000 pounds in 1961 to 623,600 pounds in 1964. The value of those imports rose from C\$54,000 in 1961 to C\$398,341 in 1964.

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Canada's share of the canned salmon market in South Africa rose from 55 percent in 1963 to 72.8 percent in 1964.

In the South African market, Canadian canned salmon competes with lower-priced salmon canned in Japan and Norway. Those countries dominated the South African salmon market for several years prior to 1962, Canadian salmon shipments to South Africa benefitted

Canada (Contd.):

from a relaxation of South African import restrictions and a shortage of Japanese salm-

South African importers of Canadian canned salmon report good prospects for the coming year, provided Canadian prices remain in a competitive range. The South African importers also report increasing sales of Canadian smoked and frozen salmon. (Foreign Trade, Canadian Department of Trade and Commerce, August 1965.)



Denmark

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EX-VESSEL PRICE TRENDS FOR SELECTED SPECIES, JANUARY-APRIL 1965 WITH COMPARISONS:

Comparing average prices received by Danish and New England fishermen in early 1965 shows that cod and haddock brought better prices in the United States (Boston, Mass.), but prices were higher in Denmark for pollock, hake, wolffish, halibut, whiting, and flatfish.

With the single exception of Danish haddock, average prices for those species in both areas were higher in January-April 1965 than in the same period of 1964.

Export trends strongly influence Danish ex-vessel prices since the bulk of Danish landings are processed into export products. About two-thirds of the Danish catch is accounted for by industrial fish landings and food fish landings of cod, plaice, and herring. Average ex-vessel prices for all of those items were higher in January-April 1965 than in the same period of 1964. The increase was 26 percent for cod (drawn), 35 percent for plaice (drawn), 33 percent for herring (for food), and 9 percent for industrial fish.

The gain in ex-vessel cod prices reflects the increasing world demand for groundfish fillets and blocks. There is also a growing demand in Europe for the quality Danish pack of frozen herring fillets and plaice fillets. Ex-vessel prices for industrial fish increased with the rising world market for fish meal and

A continuation of the trend towards higher ex-vessel prices was indicated by preliminary reports through July 1965. In addition, fishery

	January - Apr	ril 1965	IL S LE S S	January-April 1964				
Denm	ark	New Er	gland1/	Denmark		New En	gland1/	
Species2/		ar same such	Species3/	Species2/			Species3/	
Cod (Torsk):	(U. S. Ce	nts Per Pound)	Cod:	Cod (Torsk):	(U. S. C	ents Per Pound)	Cod:	
ive 6.58 8.28 (B) Large 7.30 10.71 (B) Market ressed 6.70		Live Drawn Dressed	5.39 5.79 5.79	8.11 (B) 9.21 (B)	Large Market			
Coalfish (Sej)	8.88	7.86 (B)	Pollock	ck Coalfish (Sej)		5.99 (B)	Pollock	
Haddock (Kuller)	8.02	12.97 (B) 11.65 (B)	Haddock: Large Scrod	Haddock (Kuller)	8.09	10.70 (B) 9.90 (B)	Haddock: Large Scrod	
Hake (Kulmule)	23.48	15.23 (B)	White hake	Hake (Kulmule)	19,99	11.53 (B)	White hake	
Wolffish (Havkat)	7.96	7.64 (B)	Wolffish	Wolffish (Havkat)	7.23	6.11 (B)	Wolffish	
Halibut (Helleflynder)	38.87	33.14 (B)	Halibut	Halibut (Helleflynder)	35.45	28.82 (B)	Halibut	
Whiting (Kvilling)	7.43	3.50 (G)	Whiting Round			3.02 (G)	Whiting Round	
Dab (Ising)	13.02	12.08 (NB)	Yellowtail	Dab (Ising)	9.21	9.56 (NB)	Yellowtail	

12.08 (G) Gray sole

1/Prices are at port of largest landings: B-Boston, G-Gloucester, or NB-New Bedford.
2/United States and Danish names. The fish are landed as drawn fish unless otherwise indicated.
3/United States names. Groundfish are landed drawn, except hake which is dressed; flatfish are landed round; and whiting prices shown are for round fish.

Witch (Skaerising)

10.43

11.27 (G)

Gray sole

Note: Comparisons are for the same or similar species.

13,42

Witch (Skaerising)

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Denmark (Contd.):

Species1/	Januar	y-April	Year 1964
Species	1965	1964	10169
	(U.	S. Cents Per	Pound)
Coalfish (Sej)	8,88	1 8.42	8.22
od (Torsk):			Full Short
Live	6.58	5.39	5.79
Drawn	7.30	5.79	6.71
Dressed	6.70	5.79	6.31
ommon mussel			
(Blaamusling)	.39	.39	.33
ommon sole (Tunge)	81.82	66.69	66.49
ab (Ising)	13.02	9.21	9.47
el (Aal):			
Silver (Blanke)	82.67	61.76	69.39
Yellow (Gule)	49.39	39.07	41,82
el pout (Kvabber)	10.92	10.33	10.13
lounder (Skrubbe)	6,84	5.52	6.84
arpike (Hornfisk)	18.88	5.13	3,62
addock (Kuller)	8.02	8.09	7.70
ake (Kulmule)	23,48	19.99	22,10
alibut (Helleflynder)	38.87	35,45	36.04
erring (Sild) for food	4.54	3,42	4.01
dustrial (Industrifisk)2/	1.51	1.38	1,38
emon sole (Rødtunge)	25, 19	21.24	19,99
ing (Lange)	6,44	5.59	5.79
obster (Hummer):	-	1	
Norway (Dybvands)	40.38	25.85	30.06
Common (Almindelige .	120.23	95.89	121.54
fackerel (Makrel)	7.50	5,52	6.05
ctopus (Blacksprutte)	1.84	12.69	16.38
ike (Gedde)	30.06	26,57	27,82
laice (Rødspaette):	30.00	20,07	27,102
Live	17.23	12.04	13.09
	17.10	12.64	12.56
Drawn orbeagle (Sildehaj)	23.28	25.06	20.13
oe (Rogn), mostly cod	15.06	16,25	15.72
almon (Laks)	98.79	129.50	121.15
hrimp (Rejer):	20.72	120,00	101,10
Deep-water	26,70	24.99	29.60
	98.66	108,45	99.58
Ordinary	11.77		8.22
prat (Brisling)	51.50	7.37	
urbot (Pigvar)		28.22	29.86
Whiting (Kvilling) for food	7.43	6.18	6.05
itch (Skaerising)	13.42	10.13	11.51
Volffish (Havkat)	7.96	7.23	8.02

1/United States and Danish names. 2/Herring, sand eels, Norway pout, whiting, etc. Note: Prices listed are mostly for drawn and dressed fish.

landings in local ports by Danish vessels during the first half of 1965 were up 19 percent from the same period of 1964. A continuation of those trends would produce record earnings for Danish fishermen in 1965. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, August 25, 1965.)

COD FILLETS AND FISH BLOCKS PRODUCTION SHORT OF EXPORT DEMAND:

The shortage of cod fillets in Denmark and the increased prices paid for them continue. One of Denmark's largest producers (a fishery cooperative) had signed contracts in September 1965 for deliveries during January-June 1966. But the price was left open for later discussion in October and November 1965. This deviation from the former practice of selling at fixed prices has been forced on the cooperative, according to its managing director, by rapid developments in production, processing, and marketing, and continuing price and wage increases.



A fillet-grading machine used in a Danish fish-filleting plant,

United States buyers of European cod fillets and fish blocks are facing higher prices and fewer supplies because of those factors. There is an increased need in Europe for fish blocks by processors, and an increased demand by consumers, in Europe and in markets as distant as Australia, for fish fillets, fish sticks and portions. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, September 22, 1965.)

IMPORTS OF FISHERY PRODUCTS, 1964 AND JANUARY-JUNE 1965:

General Trends - 1964: More than half of Danish imports of fishery products consist of fresh fish (mainly herring) landed by Swedish fishing craft in the Danish ports of Skagen and Hirtshals. Much of the herring is filleted and exported, especially to West Germany (table 1).

Denmark imports a large variety of canned fishery products, but the only canned items imported in significant quantities are Portuguese sardines, Pacific salmon, king crab meat, shrimp, and tuna. 1

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Denmark (Contd.):

Winds I List	nd adi	Tab	ole 1 - Da	nish Impo	rts of Fishery	Products by	Countrie	s, 1964	mille	te Lealer	LEPT
Commodity	United Kingdom	Norway	Sweden	Iceland	Netherlands	West Germany	United States	Other Countries	Total of	all Count Val	
1915				(M	etric Tons)				Metric Tons	1,000 Kroner	US\$ 1,000
resh or frozen: Fish	81 3	2,568 281	148, 825 94	825 2	446 2	960 9	39 1	2,258 18	156,002 410	129,728 3,282	18,741 474
alted: Herring, spiced Cod, wet and dry	17	471 541	964	2,501 262	371	:	:	3 367	4, 327 1, 171	8, 688 4, 619	1, 255 667
moked fishery products	1	14	-	214	-	-	1	-	230	965	139
anned fishery	12	140	128	30	36	1	305	1, 357	2,009	17,816	2,574
ndustral: Fish meal Herring oil Medicinal oil . Other fish oil . Fish offal	60 12 219	5, 100 75 1, 407 178		13,518 9,784 677 12 261	1,767	7 1,661 425 21,449	2,072	1 1 1/11,815 224	18,625 11,521 2,570 14,089 23,920	20, 379 15, 305 4, 722 18, 072 9, 648	2,944 2,211 682 2,611 1,394
other fishery	731	876	34,200	29	410	4,241	101	316	40,904	16, 195	2,340
Total 1964 .	1,137	11,651	184,211	28, 115	3,032	28,753	2,519	16, 360	275,778	249,419	36,032
Total 1963 .	746	9,977	135,507	14, 396	1,874	17,409	1,532	21,444	202,885	167,754	24,235

I/Includes 11, 814 metric tons of refined fish oil from Peru.

Note: Products originating in Greenland or the Faroe Islands are not included. Seaweed and agar are not included. Danish imports of seaweed in 1964 totaled 1,017 metric tons valued at Kr. 1.9 million (\$275,000) as compared to 403 tons valued at Kr. 721, 100 (\$104,200) in 1963. Danish imports of agar in 1964 were 15 tons valued at Kr. 405,000 (\$58,500) as compared to 14 tons valued at Kr. 329,400 (\$47,600) in 1963.

Commodity		1964			1963	
Commodity	Quantity	Val	ie	Quantity	Val	lue
Fresh or frozen: Salmon, fresh or chilled	Metric Tons	Kr. 1,000	US\$1,000	Metric Tons 9.6	Kr. 1,000	US\$1,000
Salmon, frozen	38.6 0.4 0.3	415.7 9.2 3.4	60.1 1.3 0.5	14.9 12.9 1.8	142.7 191.4 15.8	20.6 27.6 2.3
Total fresh and frozen	39.8	437.4	63.2	39.2	433.5	62.6
Salted: Salmon	0.5 0.3	5.1 5.1	0.7 0.7	:	:	
Total salted	0.8	10.2	1.4	•	-	-
Canned: Salmon Tuma Shrimp Crab meat Lobster meat Oysters Other shellfish Other fishery products	27.7 3.1 91.6 159.4 0.2 0.2 7.8 1.9	172.5 20.5 818.6 2,412.3 9.1 1.7 95.7 5.9	24.9 3.0 118.3 348.5 1.3 0.2 13.8 0.9	21,6 2.5 24,1 116,3 1.1 -	144.3 22.3 216.2 1,962.8 34.7	20.9 3.2 31.2 283.6 5.0
Total canned	291,9	3,536.3	510.9	167.1	2,384.5	344.5
Semipreserved: Fish	1.0 12.6	10.6 204.2	1.5 29.5	0.9 8.1	7.7 130.0	1,1 18,8
Total semipreserved	13.6	214.8	31.0	9.0	137.7	19,9
Industrial products: Fish oil	2,072.4	2,871.2	414.8	1,221.8 93.5 0.3	1,160.9 238.7 2.8	167.7 34.5 0.4
Total industrial products	2,072.4	2,871.2	414.8	1,315.7	1,402.4	202.6
Other fishery products	0,3	5.0	0.7	1,1	38.5	5.6
Grand total	2,418,8	7,074.9	1,022.0	1,532.1	4,396,6	635.2

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Denmark (Contd.):

Fish meal and fish oils are imported in considerable quantity either for domestic consumption or re-export. Iceland is an important source of both fish meal and herring oil while Peru and the United States are the leading suppliers of fish oil other than herring.

Increasing quantities of frozen fish offal are being imported (mainly from West Germany) by Danish mink raisers. Select fish offal is an important food for mink. From 1961 to 1964, Danish imports of fish offal more than doubled in quantity and tripled in value.

Seaweed and agar imports are of some importance, although they are not included in Danish fishery statistics. In 1964, Canada and Portugal were again the leading suppliers of seaweed; Portugal and Japan, the leading suppliers of agar.

Imports from the United States--1964:
Denmark's main fishery imports from the
United States are fish oil, canned crab meat,
frozen and canned salmon, and canned shrimp
(table 2). A variety of other items are imported in small amounts.

A potential Danish market may exist for such United States products as frozen fish offal, New England tuna, and live Maine lobster. Quality would be an important factor in introducing new United States products. Frozen fish offal must compete with Canadian offerings; bluefin tuna must be dressed as soon as caught in accordance with Danish practices; and lobster must be of top quality. Frozen scallops might find a market in the Danish hotels and restaurants serving tourists. Small frozen shrimp of excellent quality might be sold if competitively priced with Danish and Greenland shrimp. The latter retail for about US\$2.08 a pound.

Imports - January - June 1965: Denmark's total imports of edible fishery products from all countries in the first half of 1965 were valued at Kr. 88.4 million (\$12.8 million), an increase of 34 percent from January - June 1964. Edible fishery imports from the United States in the first half of 1965 were valued at Kr. 2.6 million (\$375,600), an increase of 46 percent from the same period of 1964. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, August 25, 1965.)

Note: See Commercial Fisheries Review, Sept. 1964 p. 63.

QUALITY CONTROLS STRICT FOR IMPORTS OF FRESH FISH:

Permission granted by the Danish Fisheries Ministry to import fresh fish from other countries—plaice from the Netherlands, for example—to augment the short local supplies of some Danish filleters has not resulted in any substantial imports for the processors in the Jutland port of Esbjerg. Quality control inspection and regulations have turned back enough imports at the Danish border to make the business somewhat risky for the foreign suppliers. The Fisheries Ministry has consistently enforced rigid quality control regulations in its efforts to maintain the reputation of Danish fishery products. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, September 22, 1965.)

VERY LIGHT FIBER FOR FISHING GEAR DEVELOPED:

The Danish Firm Roblon A/S of Frederikshavn, Denmark, claims it has developed the world's lightest synthetic fiber (a split fiber from polypropylene film) for use in fishing gear.

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Named "Multiflex," the new fiber is said to have high strength and flexibility with good abrasive qualities and knot properties.

"Multiflex" was exhibited for the first time at the 2nd Annual Fisheries Fair in Trondheim, Norway, August 19-29, 1965. Danish fishermen who have tested the new fiber report good results. It is expected to be useful in lines, ropes, and heavy-duty trawl netting. At present it is available in several colors in 5 to 7 kilo knotless rolls in the form of a straight fiber, twisted or cabled, from 2,000 denier up to 60,000 denier. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, August 31, 1965.)

Ecuador

NEW PROCESSING PLANT TO BE BUILT IN GUAYAQUIL:

The Ecuadoran Ministry of Commerce and Industries has reported that a new plant will be established in Guayaquil to freeze and can fishery products and process fish meal. Capital investment should be about \$270,000.

Ecuador (Contd.):

It is not known whether the markets for the plant's output will be foreign, domestic, or both. Both markets for Ecuadoran fishery products, however, are in a period of growth. Tuna, shrimp, and lobster are Ecuador's most important fishery products. Should the new plant process any of those species, it is likely that some of the production would be exported to the United States. If the new plant processes such species as croaker, grunt, mullet, and sea bass, the domestic market will be the primary sales outlet.



France

TUNA AND SARDINE PRICE AND

LANDING TRENDS, 1964:
Prices: In 1964, there was a small increase in average French ex-vessel prices for sardines and yellowfin tuna, but a slight decline for bluefin tuna.

		for Sardines	
19	64	19	63
Fr./Kilo 1.66	US¢/Lb. 15.4	Fr./Kilo 1.52	US¢/Lb. 14.1
3.10 4.37	28.7 40.4	3.06 4.49	28.3 41.6
	19 Fr./Kilo 1.66 3.10	1964 Fr./Kilo US¢/Lb. 1.66 US¢/Lb. 3.10 28.7	1964 19 Fr./Kilo US¢/Lb. Fr./Kilo 1.66 15.4 Fr./Kilo 1.52 3.10 28.7 3.06

Landings: Sardine landings by French vessels in 1964 amounted to 23,386 metric



Fig. 1 - French purse seiners also fish sardines at night with lights. Aboard the French vessel Rachel de Gavres near the French fishing port of Lorient, fishermen are retrieving the purseseine net.

tons as compared to 26,129 tons in 1963 and 31,739 tons in 1962. In addition, there were landings of herring, sprat, and anchovy.



Fig. 2 - Unloading sardines in boxes at the French port of Con-



Fig. 3 - A French live-bait tuna fishing vessel docked at Concarneau.

Tuna landings by French vessels in 1964 amounted to 18,486 metric tons in French ports and 10,660 tons in African ports. In 1963, the tuna landings were 15,273 tons in French ports and 10,797 tons in African ports, while in 1962 the tuna landings were 19,349 tons and 10,300 tons, respectively. Note: A more detailed report on the French fishing industry is given in Market News Leaflet 81 (based on information supplied by the United States Embassy, Paris, France). Leaflet is avail-ble on request from the Fishery Market News Service, U. S. Bu-reau of Commercial Fisheries, Rm. 510, 1815 N. Fort Myer Dr.

Arlington, Va. 22209.

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JAPANESE FIRM OFFERS TECHNICAL FISHERY ASSISTANCE TO GHANA:

Japan's second largest fishing company was expected to sign a second trawling contract with the State Fishing Corporation of Ghana to send 50 men to man two 1,850-ton Japanese-built stern trawlers to be delivered to that country by the end of 1965. The first contract of a similar nature, also involving two Japanese-built trawlers and about 50 technical people, was concluded with Ghana in August 1963. The second contract runs for 15 months, with a renewable clause. (Japan Economic Journal, August 31, 1965.)



Greenland

ATLANTIC SALMON FISHERY IN OFFSHORE WATERS:

A Faroese and a Norwegian vessel fishing off West Greenland in Davis Strait for Atlantic salmon with drift gill nets were not making substantial catches after that fishery started in early September 1965. The Faroese freezer vessel Dakur shifted from longlining for porbeagle in the Northwest Atlantic. It had caught 5 or 6 metric tons of salmon while the Norwegian vessel caught about 10 tons. Reports from the Faroese vessel in the Holsteinborg area were that the area being fished may be too far north. That vessel was in port several days to modify the gill nets for surface rather than deep fishing.

Should the catch of those vessels in international waters off Greenland become substantial, it would attract many more vessels next year, if not this year, before the season ends in December. An offshore fishery might be much more productive than the inshore fishery by Greenlanders which totaled about 1,400 tons in 1964. Reports from the inshore salmon fishery are too few to date to indicate whether it will be significantly greater this season. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, September 21, 1965.)



Hong Kong

SHRIMP INDUSTRY AND

FOREIGN TRADE, 1963-1964:

Shrimp Industry: Hong Kong's main fishing areas for shrimp trawlers, purse seiners, gill-netters, and other inshore craft are to the south of the Colony along the coast of Kwangtung Province inside the 25-fathom line. Many of those areas fall within waters claimed by the Communist Chinese Government and since 1958 fishermen based in Hong Kong have been compelled to land a portion of their catch in Mainland China as payment for their right to fish or pass through Chinese Communist waters.



The Crown Colony of Hong Kong.

As of early 1964, the Hong Kong shrimp trawler fleet numbered 1,722 craft manned by 13,776 fishermen.

Exports: Hong Kong's shrimp exports in 1963 were valued at US\$6.1 million but dropped to \$4.1 million in 1964. Japan was the principal buyer, taking 80 percent of those exports with a value of \$5 million in 1963 and \$3.4 million in 1964. The lower value in 1964 was due to strong competition from Mexican-produced shrimp which Japan has been buying. Re-exports of fishery products from Hong Kong in 1963 included fresh or frozen shrimp valued at \$1.9 million, and in 1964 the re-exports of shrimp climbed to a value of \$2.5 million.

Shrimp exports to the United States in 1963 were valued at \$254,000. But in 1964 no shrimp were exported to the United States from Hong Kong because of the Foreign Assets Control requirement of certification that the shrimp were not of Communist Chinese origin.

Hong Kong (Contd.):

Imports: Hong Kong's fishery imports from the United States have remained about the same over the past five years. In 1963, they were valued at \$1.1 million and in 1964 the value was \$1.4 million, consisting mostly of canned abalone.

Communist China has been Hong Kong's major supplier of fishery products. In 1963, Hong Kong's fishery imports from that country included fresh or frozen shrimp valued at \$1.5 million, and salted, dried, or smoked shrimp with a value of \$406,000. In 1964, the value of fresh or frozen shrimp from China climbed to \$4 million and for dried shrimp the value rose to \$787,000. The 1963 shrimp imports from the Island of Macau were valued at \$1.3 million but dropped to \$879,000 the following year. (United States Consulate, Hong Kong, May 25, 1965.)

Note: Market News Leaflet 86 gives additional and more detailed information on Hong Kong's fishing industry and foreign trade in 1963-1964. Leaflet 86 is available on request from the Fishery Market News Service, U. S. Bureau of Commercial Fisheries, 1815 N. Fort Myer Drive, Room 510, Arlington, Virginia 22209.



Iceland

EXPORT STOCKS OF PRINCIPAL FISHERY PRODUCTS, JULY 31 AND JUNE 30, 1965:

As of July 31, 1965, Iceland's stocks of frozen groundfish (fillets) for export to the United States totaled 4,797 metric tons, a gain of 469 tons from the stocks on hand June 30, 1965. (United States Embassy, Reykjavik, September 26, 1965.)

United States imports of frozen groundfish fillets from Iceland in the year 1964 totaled

Table 1 - Icelandic Export Stocks of Principal Fishery Products, July 31, 1965 Item Million US\$ Metric Kr. 1,000 Tons Groundfish, frozen;
For export to: 4,797 105.5 2,450,1 2,380.4 3,251.3 5,924 102,5 Stockfish..... 140.0 Herring, frozen 400 2,3 53,4 Industrial products: Fish meal: 2,589,4 Herring . . . 15,492 111.5 373.9 Other fish 16,1 Herring oil . . 15,917 132.1 3,067.8

Item	Qty.	Va.	lue
	Metric Tons	Million Kr.	US\$ 1,000
Groundfish, frozen:		Total Inch	
For export to:	4,328	95.2	2,210.9
Other countries	3,806	65.8	1,528,1
Stockfish	6,000	168.0	3,901,
Herring, frozen	631	3,6	83.6
Industrial products: Fish meal:			
Herring	16,685	120.1	2,789.1
Other fish	2,178	14.7	341.4
Herring oil	11,896	98.7	2,292,1

17,812 metric tons of groundfish blocks and slabs, 4,669 metric tons of cod fillets, 2,791 metric tons of haddock fillets, and 548 metric tons of ocean perch fillets.

* * * *

EXPORTS OF FISHERY PRODUCTS,

JANUARY-JUNE 1965:

During January-June 1965, there was an increase in exports of salted fish, salted fish fillets, stockfish, canned fish, frozen herring, herring oil, and herring meal, as compared with the same period in 1964, according to the Icelandic Statistical Bulletin, August 1965. Exports of frozen fish fillets, cod-liver oil, salted herring, whale oil, fish meal, and whale meal showed a considerable decrease in the first 6 months of 1965.

	JanJune 1965			JanJune 1965		
Product	Qty.	Value	f.o.b.	Qty.	Value !	1.0.b.
	Metric	1,000	US\$	Metric	1,000	US\$
	Tons	Kr.	1,000	Tons	Kr.	1,000
Salted fish, dried	1,868	36,750	853	640	16,569	384
Salted fish, uncured	19,229	325,255	7,546	19,121	298,719	6,930
Salted fish fillets	1,355	23,065	535	846	11,821	274
Wings, salted	812	11,180	259	1,130	14,270	331
Stockfish	5,477	159,933	3,710	4,501	125,157	2,904
Herring on ice	-	-	-	19	140	1
Other fish on ice	17,373	105,239	2,442	16,847	96,275	2,234
Herring, frozen	15,773	100,081	2,322	13,106	77,806	1,80
Other frozen fish, whole .	2,384		562	1,551	14,408	334
Frozen fish fillets	28,399	649,060	15,058	30,987	617,250	14,320
Shrimp and lobster, frozen	231	26,919	625	372	34,276	79
Roes, frozen	1,347	21,165	491	1,030	17,415	40
Canned fish	340	16,494	383	149	8,534	19
Cod-liver oil	3,063			6,365	56,670	1,31
Lumpfish roes, salted	716	37,259	864	383	9,526	22
Other roes for food, salted	1,974	32,723	759	2,606	39,053	90
Roes for bait, salted	525			1,675	14,013	32
Herring, salted	8,868			14,066		3,25
Herring oil	33,031	280,036	6,497	9,492	73,555	1,70
Ocean perch oil	-	-	-	28	188	1
Whale oil	774	6,698	155	2,101	18,675	43:
Fish meal	14,160			22,212		3,21
Herring meal	34,898		5,592	31,640		4,13
Ocean perch meal	730	4,600		255	1,475	3
Wastes of fish, frozen	4,080	16,173		1,919	7,142	16
Liver meal	413	2,934		307	2,032	4
Lobster and shrimp meal.	25			87	346	
Whale meal	311			780		10
Whale meat, frozen	339	3,109	72	522	4,201	9

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Iceland (Contd.):

FISHERY LANDINGS BY PRINCIPAL SPECIES, JANUARY-APRIL 1965:

Species	January -	-April
	1965	1964
	(Metri	c Tons)
Cod	155,799	219, 196
Haddock	22,895	22,983
Saithe	12, 115	11,515
Ling	2,385	2,636
Wolffish (catfish)	5,412	5,699
Cusk	1,076	2,665
Ocean perch	6,290	5,050
Halibut	203	280
Herring	49,700	65,028
Shrimp	408	89
Capelin	49, 131	8,640
Other	1,013	1,502
Total	306, 427	345, 283

Note: Except for herring which are landed round, all fish are drawn weight.

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UTILIZATION OF FISHERY LANDINGS, JANUARY-APRIL 1965:

How Utilized	January	-April
now othrzea	1965	1964
1/	(Metri	c Tons)
Herring 1/ for:		
Oil and meal	84,487	60,807
Freezing	11, 207	9,630
Salting	3, 137	3,231
Groundfish 2/ for:		
Fresh on ice	15,997	15, 180
Freezing and filleting	90, 367	109,003
Salting	59, 294	72,580
Stockfish (dried unsalted)	35,944	68,610
Canning	32	24
Oil and meal	585	1,291
Crustacean for:		
Freezing	287	53
Canning	123	36
Home consumption	4,967	4,838
Total production	306, 427	345,283

1/Whole fish.

2/Drawn fish. Source: Icelandic <u>Statistical Bulletin</u>, August 1965.

CANNING INDUSTRY

DEVELOPMENT TRENDS:

In the summer of 1965, a new Icelandic herring canning factory in Hafnarfjordur began production at 20 percent of full capacity. The factory produces kipper snacks under the brand name of a well-known Norwegian firm with extensive marketing outlets in the United States.

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The new Icelandic factory has a 5-year contract to sell its entire production to the Norwegian firm.

The new cannery is the second Icelandic canning factory established in 1965, and it gives Iceland a total of 15 such canneries. The herring canneries in Iceland recently established a new organization, the Union of Icelandic Canning Factories, to market their products abroad, but as of September 1965. the Union was not yet functioning.

A State-owned cannery (Siglo) has experienced difficulties since its establishment 3 years ago, mainly because of marketing problems. Recently the factory made a small (250,000-can) sales contract with a firm in West Germany. Production under that contract has been delayed pending design of the cans, which will carry the label of the German firm and be marketed by the German company. The German connection is said to offer "tremendous possibilities," but price, in the face of a 30-percent tariff, may cause initial problems.

The Government of Iceland has encouraged the building of canning factories because of the substantial increase in the export value of herring and other fish and shellfish when shipped as a finished product rather than as a raw material. The Siglo cannery was built primarily to solve an unemployment problem in its area and to serve as a pilot plant for the development of a domestic canning industry.

In 1964, Iceland exported only 380.5 metric tons of canned fish, but in the first 6 months of 1965, a total of 340.2 tons were exported. Furthermore, according to advance sales contracts, it is estimated that total canned fish exports in 1965 will be over 1,000 tons. If that trend continues, fish canning may become a major industry in Iceland. (United States Embassy, Reykjavik, September 15, 1965.)



Japan

FROZEN TUNA EXPORTS TO U. S. AND PUERTO RICO, JUNE-JULY 1965:

Japan's exports of frozen tuna to the United States and Puerto Rico in July 1965 were up 31.6 percent in quantity and 30.2 percent in value from the previous month's exports.

Shipments of albacore tuna to Puerto Rico increased sharply in July -- about triple the June shipments. Shipments to Puerto Rico

Japan (Contd.):

	Jul	y	June		
Species	Qty.	Value	Qty.	Value	
411	Short Tons	US\$ 1,000	Short Tons	US\$ 1,000	
Albacore: United States Puerto Rico	4,910 5,183	1,424 1,492	6,518 1,540	1,901 461	
Total	10,093	2,916	8,058	2,362	
Yellowfin: United States Puerto Rico	2,361 2,258	803 637	1,771 1,482	559 437	
Total	4,619	1,440	3,253	996	
Big-eyed: United States Puerto Rico	252	34	57 5	14	
Total	252	34	62	15	
Total United States	7,271	2,227	8,346	2,474	
Total Puerto Rico	7,693	2,163	3,027	899	
Grand Total	14,964	4,390	11,373	3,373	

also were up for yellowfin and big-eyed tuna. (Fisheries Attache, United States Embassy, Tokyo, September 14, 1965.)

Note: See Commercial Fisheries Review, September 1965 p. 64.

TUNA EXPORT CONFERENCE IN NEW YORK CITY:

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A two-day (September 30-October 1, 1965) Japanese Export Conference sponsored by the Japanese Ministry of International Trade and Industry and the Japan Export Trade Promotion Organization (JETRO) was held in New York City. Object was to promote and stabilize the export of Japanese products. The meeting was held in the United States to permit a direct exchange of views between Japanese tuna producers, processors, and exporters and to provide first-hand observation of market conditions in the United States. The Conference agenda included: (1) actual condition (production, imports, etc.) of the United States tuna industry; (2) present status and future outlook for Japanese canned tuna on the United States market; (3) present status and future outlook for Japanese frozen and fresh tuna for export to the United States; and (4) export promotion measures.

Fourteen members from Japan representing different segments of the tuna industry, including Government representatives, were scheduled to attend the New York conference. I but this was based on over 50 catcher vessels

Some members of the Japanese tuna delegation were planning on spending several days in the Los Angeles area (prior to the New York City conference) for meetings with resident representatives of Japanese trading firms and inspecting local processing facilities. (Katsuo-Maguro Tsushin, August 20; Kanzume Nippo, August 28; Suisan Tsushin, September 15, 1965.)

TUNA FLEET ACTIVITIES

AND LANDINGS:

The Japanese tuna mothership Yuyo Maru (5,043 gross tons) ended fishing operations September 2, 1965, and landed 4,708 metric tons of fish, consisting of: yellowfin 1,707 tons (36 percent); albacore 1,569 tons (33 percent); other tuna 507 tons (11 percent); spearfish 443 tons (9 percent); shark 420 tons (9 percent); and other fish 72 tons (2 percent). The mothership spent 104 days on the fishing grounds near the Fiji Islands in the South Pacific.



Japanese fishing vessels fish in all the world's oceans

The fleet's original target was 8,000 tons

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Japan (Contd.):

fishing for the mothership. Actually there were only about 40 vessels, accounting in part for the lower catch. The catcher vessels averaged 2.23 metric tons of fish a day as compared to last year's average of 2.3 tons.

About 1,100 tons of the mothership's catch were transshipped to southern California on the 1,430-ton refrigerated carrier Shoyo Maru. The carrier vessel was scheduled to de-liver her cargo August 27.

Twenty of the tuna long-line vessels which fished for the mothership Yuyo Maru were instructed to proceed to American Samoa to fish for one of the two American firms operating tuna canneries on that Island. The Japanese Government, which has allotted an annual production quota of about 27,000 short tons to Japanese vessels operating out of American Samoa, is said to be looking with favor on this new development, for actual landings at that base, as of early September 1965, only totaled slightly over 10,000 tons.

In August 1965, a total of 19 Japanese tuna long-line vessels landed 1,413 metric tons of fish at Penang, Malaysia, and Port Louis, Mauritius Island. In July, a total of 15 vessels landed 1.031 metric tons of fish, mainly tuna, at those two overseas bases. (Katsuo-Maguro Tsushin, August 5 & 27, and September 2, 3, & 6, 1965.)

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TUNA LANDINGS AT YAIZU, AUGUST 1965:

A total of 11,210 metric tons of fish, primarily tuna, was landed at the Japanese port of Yaizu (leading tuna port) in August 1965 as compared to 10,102 tons for August 1964, according to data compiled by the Yaizu Fishermen's Cooperative Association. By species (August 1964 landings in parentheses): bluefin 5,908 (5,624) metric tons; albacore 654 (433) tons; skipjack 3,573 (3,451) tons; mackerel 193 (87) tons; and other species 882 (587) tons. Average prices paid per short ton for tuna in August 1965 were up significantly from the same month in 1964: bluefin US\$416, up \$124; albacore \$295, up \$8; and skipjack \$232, up 33. (Kanzume Nippo, September 3, 1965.)

TUNA VESSELS OPERATING IN ATLANTIC:

According to a JETRO (Japan Export Trade Promotion Organization) report, the number of Japanese tuna long-line vessels operating in the Atlantic Ocean has increased greatly this year and as of August 1965 totaled 154 vessels. Catch per vessel had declined sharply, but the total Japanese Atlantic tuna catch is not expected to show much of a decrease due to the increase in effort. (Nihon Suisan Shimbun, August 18, 1965.)

INTEREST INCREASES IN POLE-AND-LINE TUNA FISHERY:

Interest in Japan has heightened among tuna fishermen in the pole-and-line fishery for skipjack and albacore following the second successive successful season experienced by those engaged in that fishery. This revival of interest is said to be clearly revealed in the current new construction for pole-and-line vessels and in trading transactions involving fishing vessel rights.

This development represents a reversal in the trend of the early 1960's. Beginning in 1961 the peak of 540 over 50-ton pole-andline vessels declined rapidly in the ensuing years to about 300. During that same period, the tuna long-line fishery expanded rapidly, with many new and larger vessels built. However, as a result of the generally depressive conditions faced by the long-line fishery (associated with a decline in catch rate per hook, extended vessel trips, and increased cost of operation) in the last two years or so, the fishermen's interest in long-lining for tuna has waned greatly.

One important development which has served to stabilize the pole-and-line fishery is said to be the introduction two years ago of a forced circulation salt-water bait tank, which has made possible the keepting of live bait for extended periods. This in turn has enabled pole-and-line vessels to extend their operations to the reliable skipjack grounds near the Mariana Islands and Palau Island during the winter season, thereby assuring year-round operation. During the summer, the vessels fish for skipjack and albacore off the Japanese home islands. (Suisan Keizai Shimbun, August 27, 1965.)

Japan (Contd.):

TUNA CANNERS ADOPT MEASURES TO OVERCOME DROP IN EXPORT SALES:

The Japan Tuna Packers Association on August 7, 1965, held a directors meeting at Shimizu, to discuss measures to overcome the crisis threatening the industry as a result of substantially lower exports of canned tuna in brine to the United States. The reportedly unprecedented decline in sales had resulted in building up heavy inventories (one report estimated inventory of the Canned Tuna Sales Company at 1,5 million cases) and in burdening the canners with additional loan interest and storage expenses. The Association directors adopted the following policy:

- 1. From 500,000-700,000 cases of tuna in brine held in stock by the Sales Company for export during the current business year (ending November 30, 1965) will not be offered for sale. The Association's managing director will be delegated the responsibility of reducing as much as possible the packers' loan interest and storage costs for that lot.
- 2. Consignments to the Sales Company of canned tuna in brine for export for business year 1966 (December 1965-November 1966) will be set at 1.5 million cases (to reduce inventories to normal level).
- 3. A total of 50,000 cases of canned lightmeat tuna were to be packed during the months of August and September in response to the request of exporting firms, which have offered to pay 100 yen (US\$0.28) more a case to packers for putting up additional quantities of the 7-oz. and 3.5-oz. packs. Note: Earlier press reports referred to 7-oz. and 13-oz. packs. (Kanzume Nippo, August 9, 1965.)

TUNA PACKERS SEEK CUT IN STORAGE FEES:

Following the resolution adopted at an August 27 meeting to seek a 50-percent reduction of storage fees for canned tuna in brine for export to the United States by March 1966, representatives of the Japan Tuna Packers Association started in late August 1965 to approach warehousing firms in the Shizuoka area. The warehousing firms were reported as having replied to the Packers Association's representatives that they would schedule a meeting to discuss the Association's request. It was also reported that the warehousing

firms likely will not grant the full reduction in storage costs requested by the Packers Association. (<u>Kanzume Nippo</u>, September 4, 1965.)

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SALES OF CANNED RED SALMON REPORTED GOOD:

About 800,000 cases of Japanese canned red salmon had been shipped to Great Britain as of early July 31, 1965. Japan hopes to sell the remaining pack of red salmon by year's end.

The export price per case (48 $\frac{1}{2}$ -lb. cans) of canned red salmon was set in June 1965 by the Canned Salmon Sales Company at 155 shillings (US\$21.70) for July-August, 156 shillings (\$21.84) for September-October, and 158 shillings (\$22.12) for November-December. (Suisancho Nippo, August 7, 1965.)

KING CRAB POT FISHING TEST IN BRISTOL BAY:

According to the fleet manager of the Japanese king crab factoryship Tainichi Maru (5,859 gross tons), which returned to Yokohama, September 5, 1965, fishing conditions in Bristol Bay were satisfactory this year but gear losses suffered as a result of Soviet fishing activities were extensive. (Note: U.S.S.R. operated 3 crab factoryships in the Bay area.) The Japanese fleet lost a total of about 18,000 shackles of tangle net. The manager also reported that the Japanese fleet fished crab pots (on a limited basis) for about two months to determine the suitability of that gear. As yet, definite conclusions concerning the gear's practicality have not been reached, but as many as 22 crabs per pot were taken. He stated that he hopes to conduct a pot-fishing test on a full-scale basis next year. (Suisan Keizai Shimbun, September 8, 1965.)

BRISTOL BAY KING CRAB FACTORYSHIP PRODUCTION:

King crab fishing in Bristol Bay picked up considerably in late August 1965 and the Japanese king crab factoryship Tokei Maru (5,385 gross tons) was expected to meet her production target of 94,467 cases (48 ½-lb. cans) around August 31. The factoryship Tainichi Maru (5,859 gross tons) which met her target of 90,533 cases in mid-August arrived at Ha-

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Japan (Contd.):



Japanese king crab factoryship Tokei Maru.

kodate, Japan, August 27. (Suisan Tsushin & Suisancho Nippo, August 28, 1965.)

Note: See Commercial Fisheries Review, October 1965 p. 82.

TRAWLER ENDS GULF OF ALASKA OPERATION:

The Japanese stern trawler Taiyo Maru No. 82 (2,886 gross tons) was scheduled to return to Tokyo on August 12, 1965. The vessel, which left the Gulf of Alaska fishing grounds on July 31, caught a total of 7,500 metric tons of fish, including 6,300 tons of rockfish, 400 tons of sablefish, and 200 tons of Alaska pollock. (Suisan Keizai Shimbun, August 7, 1965.)

FACTORYSHIP ENDS BERING SEA BOTTOMFISH OPERATION:

The Japanese mothership fleet led by the factoryship Chichibu Maru (7,472 gross tons) was scheduled to end operations in the Bering Sea on August 5, 1965, and to return to Kurihama around August 17. The factoryship, which began fishing January 28, was after shrimp but switched to fishing for other bottomfish as the season progressed due to the scarcity of shrimp. She was reported to have packed 1,470 cases (24 cans of 2,65 oz) of shrimp, 1,171 metric tons of frozen shrimp, 12,374 tons of frozen rockfish, 1,792 tons of flatfish, 880 tons of black cod, and 481 tons of frozen herring.

Due to the excellent market in Japan for rockfish (average price 110,000 yen or US\$306 a metric ton) and the generally higher prices (reported to be about 20-30 percent higher than a year ago) for other species, the Chichibu Maru's operation will likely end in the black for the first time since that mothership began operating in the Bering Sea. The fac-

toryship is scheduled to be used as a refrigerated carrier for the North Pacific and Bering Sea bottomfish fleet for 90 days and was scheduled to leave Japan, September 1, 1965, on that assignment. (Suisan Tsushin, August 5, 1965.)

TWO FIRMS TO CONDUCT TEST FISHING OFF SOUTH AMERICA:

Two of Japan's major fishing companies are planning to conduct test fishing in the waters off South America. One of the firms is planning to send a 500-ton trawler to the waters off the Guianas and the other firm a 1,000-ton trawler to the waters off La Plata, Argentina. Both firms have not yet submitted their plans to the Fisheries Agency for approval, but the Agency is expected to approve them when they do. (Minato Shimbun, September 3, 1965.)

THREE BOTTOMFISH FLEETS OPERATING IN OKHOTSK SEA:

Three Japanese mothership-type bottomfish fleets departed for the Okhotsk Sea in mid-



Fig. 1 - Japanese factoryship Chiyo Maru.



Fig. 2 - A netload of starfish, sea snails, and other types of sea animals on the deck of the factoryship Chiyo Manu.

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Japan (Contd.):

August 1965. The fleets were led by the motherships Chiyo Maru (7,149 gross tons), Otsu Maru (8,033 gross tons), and the Takashima Maru (9,856 gross tons). The combined production target totals 27,000 metric tons of bottomfish. They are expected to remain on the fishing grounds until early October. (Nihon Suisan Shimbun, August 11, 1965.)

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CANNED CRAB MEAT EXPORTS, MAY-JUNE 1964-1965:

Japanese exports of canned crab meat in May-June 1965 totaled 32,549 cases ($48\frac{1}{2}$ -lb. cans), a decline of 21 percent from the 41,077 cases shipped in the same period of 1964. The canned crab exports in June 1965 were only slightly below those in June 1964, but May 1965 shipments were insignificant.

Japanese Expo		une 1964		y Country	,
Period and Type	United States	United Kingdom	Canada	Other Countries	Total
	(1	No. of Cas	es of 48	1-Lb. Can	ıs)
1965: May: King crab!			-	867	867
Iune: King crab Other crab	11,810 2,540	500 1,675	100	10,085 4,972	22, 395 9, 287
Total all species	14,350	2, 175	100	15,057	31,682
May - June: Total all species	14, 350	2, 175	100	15,924	32,549
1964: May: King crab Other crab	2,241 400	2,550 502	200	1,252 25	6,243 927
Total all species	2,641	3,052	200	1,277	7, 170
June: King crab Other crab	4, 385 3, 150	8,800 7,351	1, 150	5,818 3,253	19,003
Total all species	7,535	16, 151	1, 150	9,071	33,907
May-June: Total all species	,	19,203	1, 350	10, 348	41,077

I/Only type exported in May 1965.
Note: Japanese exports of canned crab meat other than king consist mainly of kegani and zuwai crab.
Source: Japanese Canned Crab Sales Co.

Compared with the same month of 1964, canned crab exports in June 1965 showed a sharp decline in sales to the United Kingdom, but much higher shipments to the United States and other countries.

King crab made up 69 percent of the June 1965 exports as compared to only 56 percent in



Inspecting and packing canned crab meat aboard a Japanese crab factoryship in the North Pacific.

June 1964. But the June 1965 exports included only 6,612 cases of kegani crab and 2,675 cases of zuwai crab as compared to 9,267 cases and 5,637 cases, respectively, in June 1964. (Fisheries Attache, United States Embassy, Tokyo, August 6, 1965.)

Note: See Commercial Fisheries Review, July 1965 p. 74.

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EXPORTS OF FROZEN RAINBOW TROUT, JULY 1965:

Japan's exports of frozen rainbow trout in July 1965 were down 10 percent in quantity and 7 percent in value from the previous month's exports. As in June, the United States was the principal buyer of Japanese frozen rainbow trout, accounting for 56 percent in

Destination	July		Jur	ne .
by Country	Qty.	Value	Qty.	Value
United States. United Kingdom Belgium Canada. Australia West Germany Netherlands	Short Tons 112 29 27 29 1 1 1 200	US\$ 79,731 18,994 22,575 20,589 1,114 569 1,143	Short Tons 96 77 26 11 2 2 7 2 223	US\$ 71, 42: 46, 32: 20, 80: 8, 10: 1, 56: 1, 13: 4, 69: 1, 53: 155, 58:

in quantity and 55 percent in value of the total July exports. (Fisheries Attache, United States Embassy, Tokyo, September 14, 1965.)

Note: See Commercial Fisheries Review, September 1965 p. 69.

CANNED MACKEREL EXPORT PRICES:

Japanese mackerel canners of eastern Hokkaido, in line with the recommendations

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Japan (Contd.):

of the Canned Mackerel Export Committe of the Hokkaido Marine Products Packers Association, agreed to the following export prices for their natural pack:

	Price Per Case 1
Ozs.	US\$
15.0	2/6,20
7.8	2/3.85
	15.0

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MACKEREL PACK AND MARKET TRENDS:

Mackerel fishing in the North Pacific off eastern Hokkaido, Japan, continued excellent. As of early September 1965, Hokkaido canners had packed an estimated 400,000 cases. Predictions were being made that they would be able to put up an additional 200,000 cases before season's end. Of the predicted total pack of 600,000 cases, about 250,000 cases were expected to be packed for export.

The packers, through their trading firms, were also reported as having offered to sell to the National Marketing Corporation (NAMARCO) of the Philippine Islands 200,000 cases of mackerel for shipment in November. It was earlier reported that they had set the following export prices for their product (c. & f. Manila): natural 15-oz. 48 cans--\$6.25 a case and natural 7.8-oz. 48 cans--\$3.90 a case. (Kanzume Nippo, September 3 & 4; Suisan Tsushin, August 27, 1965.)

EXPORTS OF FRESH AND FROZEN MARINE PRODUCTS, 1964:

Japan's exports of fresh and frozen marine products in 1964 were up 42.4 percent in quantity and 19.9 percent in value from the previous year's exports. In 1964, there was an increase in exports of nearly all species of tuna. The exception was skipjack for which exports were down 27.7 percent in quantity and 34.0 percent in value.

The total exports of fresh and frozen tuna in 1964 were up 19.8 percent in quantity and 20.8 percent in value as compared with 1963. The biggest increase was in exports of albacore which were up 39.4 percent in quantity

and 42.1 percent in value from the previous year.

Quantity Value Quantity Value Metric Tons 1,000 Tons 1,000 Tons 1,000 Metric Tons 1,000 Tons 1,000 Metric Metric	Constant	1	964	1963		
Tuna: Skipjack . 3,549 560 4,909 84 Albacore . 77,136 26,739 55,318 18,8: Yellowfin . 69,427 23,049 62,633 20,58 Bluefin . 8,908 2,701 7,809 2,48 Other . 16,123 3,687 15,507 4,22 Total tuna . 175,143 56,736 146,176 46,90 Swordfish (broadbill): Steaks . 2,020 1,640 2,268 1,77 Fillets . 5,382 3,033 4,407 2,48 Other swordfish . 1,958 593 2,042 50 Total swordfish 9,360 5,266 8,717 4,80 Other Species: Sea bream . 21,609 3,485 10,946 2,07 Yellowtail . 6 8 6 8 6 8 717 4,80 Mackerel . 3,004 437 2,350 33 Saury . 4,738 9,34 6,049 1,00 Saury . 4,738 9,34 6,049 1,00 Saury . 4,738 9,34 6,049 1,00 Salmon . 1,395 1,471 1,154 1,40 Mackerel shark . 740 229 545 12 Scallop and abalone 0,740 229 545 7,22 Scallop and abalone 0,755 1,683 13,384 1,33 Squid	Species	Quantity	Value	Quantity	Value	
Sklpjack 3,549 560 4,909 8 Albacore 77,136 26,739 55,318 18,8 Yellowfin 69,427 23,049 62,633 20,55 Bluefin 8,908 2,701 7,809 2,45 Other 16,123 3,687 15,507 4,26 Total tuna 175,143 56,736 146,176 46,96 Swordfish (broadbill): 2,020 1,640 2,268 1,77 2,45 Tillets 5,382 3,033 4,407 2,45 5 Other swordfish 1,958 593 2,042 5 Total swordfish 9,360 5,266 8,717 4,80 Other Species: 58ea bream 21,609 3,485 10,946 2,07 Yellowtail 6 8 8 10,946 2,07 Yellowtail 16 8 10,946 2,07 Salmon 1,395 1,471 1,154 1,4 Salm	Tuna:				US\$ 1,000	
Bluefin	Skipjack Albacore	77, 136	26,739	55,318	18, 811 20, 552	
Swordfish (broadbill): 2,020 1,640 2,268 1,77 Fillets 5,382 3,033 4,407 2,48 Chter swordfish 1,958 593 2,042 54 Total swordfish 9,360 5,266 8,717 4,86 Other Species: 58a bream 21,609 3,485 10,946 2,07 Sea bream 21,609 3,485 10,946 2,07 Yellowtail 6 8 6 8 6 Mackerel 3,004 437 2,350 33 Salmon 11 2 39 39 39 Salmon 1,395 1,471 1,154 1,44 <td< td=""><td>Bluefin</td><td>8,908</td><td>2,701</td><td>7,809</td><td>2, 495 4, 263</td></td<>	Bluefin	8,908	2,701	7,809	2, 495 4, 263	
Fillets 5,382 3,033 4,407 2,43 Other swordfish 9,360 5,266 8,717 4,86 Other Species: Sea bream 21,609 3,485 10,946 2,07 Yellowtail 6 8 6 8 6 3,04 437 2,350 33 Sardine 11 2 39 34 6,049 1,00 3,04 1,395 1,471 1,154 1,44 1,154 1,44 1,54 1,41 1,54 1,41 1,54 1,41 1,54 1,41 1,54 1,41 1,54 1,41 1,54 1,41 1,54 1,41 1,54 1,41 1,35 1,76 1,76 3,695 7,22 545 1.7 1,23 1,23 1,23 1,44 1,33 1,36 1,36 1,36 1,36 1,36 1,36 1,36 1,36 1,36 1,36 1,36 1,36 1,36 1,36 1,36 1,36 1,36 1,36 </td <td>Total tuna</td> <td>175, 143</td> <td>56,736</td> <td>146, 176</td> <td>46,969</td>	Total tuna	175, 143	56,736	146, 176	46,969	
Other Species: Sea bream 21,609 3,485 10,946 2,07 Yellowtail 6 8 6 6 Mackerel 3,004 437 2,350 35 Sardine 11 2 39 Salury 4,738 934 6,049 1,00 Salmon 1,395 1,471 1,154 1,4 Rainbow trout 1,965 1,683 1,384 1,3 1,34 1,3 Mackerel shark 740 229 545 1,	Steaks Fillets	5,382	3,033	4,407	1,773 2,496 540	
Yellowtail	Total swordfish	9,360	5,266	8,717	4,809	
Mollusks 10 10 4 Whale meat 37,752 3,610 9,068 1,74 Frogs 755 1,183 649 1,27	Sea bream Yellowtail Mackerel Sardine Saury Salmon Rainbow trout Mackerel shark Other fish Scallop and abalone Oysters Shrimp Squid Other shellfish	3,004 11 4,738 1,395 1,965 740 58,353 3 146 1,234 6,677 101	8 437 2 934 1,471 1,683 229 7,674 37 160 1,848 1,763 256	6 2,350 39 6,049 1,154 1,384 545 30,695 3 232 1,143 6,799 296	2,071 351 1,043 1,403 1,315 177 7,233 28 303 1,587 1,444 459	
T-4-1 420 250 05 050 50 50 00 00	Mollusks Whale meat	10 37,752	10 3,610	9,068	1,744	
10tal 139, 358 25,070 72,535 20, &	Total	139, 358	25,070	72,535	20,854	

Japan's 1964 exports of swordfish (including fillets and steaks) increased 7.4 percent in quantity and 9.5 percent in value over the previous year. The 1964 exports were up for other fishery products including sea bream, mackerel, rainbow trout, and whale meat. (Fisheries Attache, United States Embassy, Tokyo, March 31, 1965.)

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TWO FIRMS TO BUILD LARGE STERN TRAWLERS FOR NORTHWEST ATLANTIC FISHERIES:

Two Japanese fishing companies have submitted applications to the Fisheries Agency to each operate a large stern trawler (to be newly constructed) in the northwestern Atlantic Ocean. The trawlers, which will be based at St. Pierre and Miquelon (French) south of Newfoundland, principally will fish for cod. The Agency will likely approve their applications.

Japan (Contd.):

Both firms previously operated trawlers in the northwest Atlantic. One of the firms operated the 1,130-ton trawler Aoi Maru No. 2 for about 1½ years (beginning in 1962) over an extensive area in the Atlantic Ocean. The other firm operated the converted 3,698-ton stern trawler Tenyo Maru No. 3 in 1963-64.

One of the two firms is planning to construct a 1,000-ton trawler and the other a 3,000-ton vessel. (Suisan Keizai Shimbun, August 27, 1965.)

A third Japanese fishing company has decided to submit to the Fisheries Agency an application to build a 2,500-ton stern trawler for operation in the Atlantic Ocean off Africa. To meet government requirements for constructing that vessel, the firm plans to decommission a portable-boat-carrying tuna mothership. (Suisan Tsushin, September 4, 1965.)

FISHING VESSEL CONSTRUCTION, 1960-64:

Japanese shipyards built 2,518 steel fishing vessels during the five years 1960-64, totaling 565,116 gross tons. The size of the vessels built in that period ranged from 11 to 11,193 tons.

In 1964, Japan built 502 steel vessels as against 447 licensed for construction during that year. The difference between the number of vessels built in 1964 and the number authorized for construction represents a backlog of orders that could not be met during the previous year. A total of 631 steel fishing vessels was built in 1963. (Fisheries Attache, United States Embassy, Tokyo, September 9, 1965.)

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FISHING VESSEL

CONSTRUCTION LOANS ARE UP:

Japanese Agriculture-Fisheries Bank data for the period April-July 1965 show that the Bank loaned 1,635 million yen (US\$4.5 million) to 141 individuals or firms, an increase in loan value of about 10 percent over the same period a year earlier. There was a decrease in loans for the construction of tuna long-line vessels and a significant increase in loans for the construction of 190-ton skip-

jack pole-and-line vessels. (Suisancho Nippo, September 3, 1965.)

FISHERIES AGENCY REQUESTED TO STUDY INTERNATIONAL

The International Fisheries Countermeasures Committee submitted on August 27, 1965, to the Japanese Fisheries Agency a request to establish a special group to study the many problems, both domestic and foreign, faced by Japan in the area of international fisheries and to develop plans to promote and stabilize the fisheries. The special committee is not expected to take up problems involving the tuna fisheries inasmuch as a special tuna study group already exists.

The Countermeasures Committee is sponsored by 12 major industry organizations in Japan, including the Japan Fisheries Society, Northern Water Mothership Council (representing firms operating motherships), Japan Whaling Association, National Federation of Fishermen's Cooperative Associations (ZENGYOREN), National Federation of Tuna Fishermen's Cooperative Associations (NIKKATSUREN), and the National Federation of Salmon Fishermen's Cooperative Associations (NIKKEIREN). (Suisancho Nippo, August 28, 1965.)

SOVIET UNION-JAPAN POLLOCK PRICE

NEGOTIATION DEADLOCKED: The Japanese fisheries delegation and Soviet representatives (meeting in Nakhodka) are reported deadlocked over the question as to how much Japan should pay for Alaska pollock delivered by Soviet trawlers operating in the Okhotsk Sea to a Japanese firm's fish meal factoryship. The Japanese delegation is offering US\$16 a metric ton for the first 45,000 tons of fish, price to be increased \$1 a ton for each additional 5,000 tons thereafter. The Soviet Union is asking about \$5 a ton more. In January-March 1965, the Japanese firm operating the factoryship paid \$16 a ton for Soviet-caught Alaska pollock. (Suisan Tsushin, September 4, 1965.)

APPLICATION FOR IMPORTATION
OF SOVIET-PRODUCED KELP:

OF SOVIET-PRODUCED KELP:

The Japanese kelp industry has submitted an application to the Japanese Government to

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Japan (Contd.):

import a total of 1,000 metric tons of kelp from the Soviet Union. Kelp was one of the products displayed at the Soviet trade fair held in Japan and the Soviet Union is said to be eager to export that product.

For a number of years since 1940 Japanese kelp production totaled over 90,000 metric tons a year, according to the industry's application. But as a result of having lost the territories of Sakhalin and the Kuriles, Japan's kelp production declined by 60 percent and in 1964 dropped to a low of 24,000 tons. (Minato Shimbun, July 30, 1965.)





Republic of Korea

PLANS TO BUILD 572 FISHING VESSELS:

The Republic of South Korea (ROK) is reported planning to build a total of 572 fishing vessels under a 3-Year Plan. Of that number, the ROK plans to place an order for 259 vessels in Japan and to build 313 vessels in Korea. Types of vessels are trawlers, surrounding-net and auxiliary, tuna long-liners, refrigerated carriers, and whale catchers. The order in Japan would call for 253 vessels the first year, 5 vessels the second year, and 1 vessel the third year. Building plans in Korea call for 122 vessels the first year, 118 vessels the second year, and 73 vessels the third year.

Construction of the 572 vessels would be financed with US\$190 million to be obtained from the following sources: \$100 million from the total \$300 million in reparations owed to the ROK by Japan, plus US\$90 million from the fisheries assistance fund which Japan agreed to provide to the ROK under the normalization agreement recently concluded. (Suisancho Nippo, September 4, 1965.)



Mexico

SHRIMP EXPORTS TO EUROPE AND ASIA GRANTED TAX ADVANTAGE:

The Mexican ad valorem export tax on frozen shrimp exported to Europe and Asia will be 3.3 U. S. cents a pound less than that on

frozen shrimp exports to the United States. The discriminatory rate in favor of countries other than United States is to be effective July 9 to December 31, 1965, according to an announcement by the Mexican Government in Diario Oficial, August 16, 1965.

The United States is now buying over 99 percent of Mexico's frozen shrimp exports. The new export tax rates (described as a subsidy for European and Asian shipments) are expected to have very little effect on current trade. Exporters can qualify for the lower tax only if shipments are made directly from Mexican ports in Mexican vessels. At present, Mexico has only one freighter with refrigerated cargo facilities. Furthermore, it is not likely that Mexico can make much headway in the rather limited European market, which is now supplied largely from sources in the Middle East which reportedly have low production costs.

The export tax on frozen shrimp is in two forms, specific and ad valorem. The specific tax is 2.50 pesos per 100 kilograms net weight (US\$0.0091 per pound). The standard ad valorem tax had been 5 percent of the declared value, which currently is 22.50 pesos per kilogram (\$0.818 per pound), making the ad valorem tax 1.125 pesos per kilogram (\$0.0409 per pound). For direct shipments to Europe and Asia, the ad valorem tax is now reduced to one percent, with no change in the rate on shipments to the United States. Thus the combined tax for shipments to the United States is \$0.05 per pound and to Europe and Asia it is \$0.017.)

Mexico may reduce the ad valorem tax on United States shrimp shipments to 4.5 percent, but the ad valorem tax for shipments to Europe and Asia would than be cut to 0.5 percent, maintaining the 4 percent differential. (Fisheries Attache, United States Embassy, Mexico, D. F., September 15, 1965.)



Norway

CANNED FISH EXPORTS, JANUARY 1-MAY 22, 1965, WITH COMPARISONS:

Preliminary data show that Norway's total exports of canned fishery products in January 1-May 22, 1965, were up about 8 percent from those in the same period of 1964. The increase was due mainly to larger shipments of

Norway (Contd.):

smoked small sild. Exports were also up for brisling, kippered herring, and sild delicatessen. But shipments were down for soft herring roe and shellfish.

Maguagian	Exmante of	Principal	Canned Fishery	Producte
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Product	Jan. 1-May 22 1965	Jan. 1-May 23 1964	
	(Metric Tons)		
Brisling	2,550 5,401 1,340 476 234 533 1,030	2,209 4,503 1,187 805 183 680 1,173	
Total	11,564	10,740	

In 1965, the Norwegian canning season for small sild began May 1, and the brisling canning season opened May 19. By June 12, 1965, the small sild pack was 155,278 standard cases and the brisling pack 114,858 standard cases. At the same date in 1964, it was 170,494 standard cases of small sild and 121,114 standard cases of brisling. Norwegian fishermen were disappointed by the relatively light catch of brisling and small sild during the early part of the 1965 season. (Norwegian Canners Export Journal, July 1965.)

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FISHERIES FAIR EMPHASIZES MODERN TECHNIQUES:

Norway's 2nd Official Fisheries Fair, held at Trondheim, August 19-29, 1965, featured the latest developments in fishing gear and electronic aids, fishing vessels and marine engines, as well as fish processing equipment. Most of the 186 exhibitors were Norwegian



Fig. 1 - A modern Norwegian purse-seine vessel. Norwegian shipyards are working actively on the international market, having built fishing vessels for countries in Asia, Africa, Latin America, and Europe.

firms. Producers from Denmark, West and East Germany, the United Kingdom, Sweden, Finland, and Poland had a total of 19 displays. Norwegian Government organizations distributed information on the development of Norwegian fisheries.



Fig. 2 - Electronic fish-finding gear aboard a Norwegian trawler. Pioneer work in developing electronic fishing aids has been done in Norway.

The Fair was attended by about 80,000 visitors. Included were visitors from Brazil, Venezuela, Cuba, the Philippines, Peru, Spain, Portugal, and Communist China, as well as from all of the major European fishing nations. The Fair provided a good opportunity for the development of export contacts.

Modern fishing techniques, production, and marketing were discussed at a 2-day conference at the Fair. There was also a special consumer section with demonstrations of how to prepare and serve fish dishes.

Several specially equipped fishing vessels called at Trondheim during the Fair. One of those, the Norwegian vessel K.S.K., featured a power block, fish pump, and electronic navigating and fish-finding gear. The equipment showed the international character of the fishing industry—the power block was manufactured in the United States, the fish pump in Chile, and the electronic equipment in Japan, Germany, and the United States.

Additional information about the Fair can be obtained from the Export Council of Norway, 290 Madison Avenue, New York, N. Y. 10017. (News of Norway, September 2, 1965, and other sources.)

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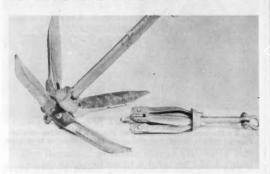
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Norway (Contd.):

FOLDING ANCHOR PRODUCED IN NORWAY:

A folding anchor is being produced in sizes up to 33 pounds by a firm in West Norway. The four arms of the anchor can be folded onto the shaft to make a compact bundle for stowing. When needed for service, the arms are unfolded and locked in place by a sliding disc on the shaft. Successful use of the an-



At left folding anchor is extended for use. At right it is closed for stowing.

chor has been reported by Norwegian coastal fishermen, and the anchor has been awarded the "Mark for Good Design Center." (The Export Council of Norway Information Service.)



Peru

FISH MEAL SITUATION, LATE AUGUST 1965:

Peruvian fish meal output in the first half of 1965 totaled 879,000 metric tons, slightly ahead of the 870,000 tons produced in the same period of 1964. July 1965 fishing was bad, however, and production dropped to only 12,000 tons, well below the 84,000 tons produced in July 1964. Peruvian anchovy fishing was closed in August 1965 as a conservation measure.

If Peruvian anchovy fishing recovers during the important fall season, total 1965 fish meal exports may be very close to the 1964 level of 1.4 million tons since inventories were at the start of 1965 about 100,000 tons above the preceding year.

While exports may hold steady this year, prices are much higher. Some spot sales had

been made at over US\$210 per ton f.o.b. Peru. Prices declined slightly by late August 1965 with spot sales reported around \$190; November-December 1965 futures at about \$170-175; and January-June 1966 deliveries moving for around \$160. (United States Embassy, Lima, August 25, 1965.)

FISH OIL EXPORTS, JANUARY-JUNE 1965:

Peruvian exports of crude and semirefined anchovy oil in the first 6 months of 1965 totaled 86,200 metric tons, an increase of 25 percent from the 69,000 tons exported in January-June 1964. Shipments to the Netherlands in the first half of 1965 increased to 56,300 tons from 35,300 tons in the same period of 1964. Shipments to West Germany increased to 15,200 tons from 10,100 tons; and those to Colombia to 7,900 tons from 4,200 tons. (U.S. Department of Agriculture, Foreign Agriculture, September 13, 1965.)



Senegal

NINE NEW TUNA VESSELS:

Senegal's tuna fishing industry was scheduled to have 9 new vessels for the 1965/66 fishing season. Five of them were being built in France and 4 in Great Britain. It is planned to have 25 such vessels in 4 years' time.

Four fish canneries in Senegal with a present processing capacity of 11,000 metric tons of tuna annually will then have a processing capacity of 30,000 to 40,000 tons a year.

A US\$1.4 million loan by the Bank of England to Senegal for the 4 vessels being built was confirmed by an agreement in June 1964 between the Government of Senegal and Great Britain.

Note: See Commercial Fisheries Review, November 1964 p. 109.



South Africa Republic

PELAGIC SHOAL FISH CATCH,

JANUARY-MAY 1965:
South Africa Republic: The Cape west coast shoal fish catch for the first 5 months of 1965 was 206,720 short tons pilchards, 30,575 tons maasbanker, 43,967 tons mackerel, 32,612 tons anchovy, and 100 tons herring.

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South Africa Republic (Contd.):

The total catch was 313,974 tons. In the same period of 1964 the total catch was 311,182 tons, made up of 223,640 tons pilchards, 19,403 tons maasbanker, 55,319 tons mackerel, 10,602 tons anchovy, and 2,218 tons herring.

South-West Africa: In the Territory of South-West Africa, the shoal catch in January-May 1965 totaled 382,201 tons and consisted of 381,917 tons pilchards and 284 tons anchovy.

Oil content of the landings in South-West Africa was averaging about 17 gallons a ton of fish. That was somewhat below the yield in 1964. The fish were plentiful and catches were only about $2\frac{1}{2}$ to 4 hours sailing from Walvis Bay.

As in 1964, the factories this season have been concentrating on the production of fish meal as production for the year has been sold in advance. In addition, the entire 1965 fish oil production has been sold to the United Kingdom in advance at a price which was higher than last year.

The 1965 canning program in South-West Africa is forecast to be about the same as in 1964 when the pack of canned pilchards amounted to 62,130 short tons. Canned pilchards are finding a larger market in South Africa, and it is expected that local consumption this year will exceed one million cases. (South African Shipping News and Fishing Industry Review, July 1965.)

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FISH OIL PRODUCTION, JANUARY-MAY 1965:

Production of fish-body oil in the Republic of South Africa and the Territory of South-West Africa during the first 5 months of 1965 totaled 36,951 short tons, a decline of 16 percent from the 43,775 short tons produced in January-May 1964.

By contrast, South African fish meal production rose from 130,300 metric tons in January-May 1965. (U. S. Department of Agriculture, Foreign Agriculture, September 13, 1965, and other sources.)

FIBERGLASS VESSELS FOR SHOAL FISHERY PROVE POPULAR:

Orders for seven 85-foot fiberglass vessels for the pilchard fishery have been reported by the Cape Town shipbuilder that introduced fiberglass construction to the shoal fishery. Those will be the largest fiberglass vessels yet built for the shoal fishery in South African waters. Powered by a 483-horsepower diesel engine, each vessel will be specially designed to range considerable distances in search of fish. Total cost of the 7 vessels will be about R1.0 million (US\$1.4 million). The first hull is to be delivered by the end of 1965, and the others are to follow at the rate of one a month.

The builder of the new 85-foot vessels pioneered in adapting fiberglass molding techniques to the construction of larger size commercial fishing vessels. A "sandwich" method of hull construction is used. (A layer of foamed plastic is "sandwiched" between layups of grass fiber.)

The firm's earlier fiberglass vessels for the pilchard fishery, such as the 74-foot Gunfi, attracted wide interest. The firm now has an order for five new 74-foot shoal vessels as well as other orders from South African firms which will keep the shipyard busy well into 1966. The fiberglass vessels have also attracted interest in Great Britain, Norway, and other countries.

One advantage of a fiberglass vessel is that maintenance costs are less than those of other vessels, according to the managing director of the Cape Town shipyard. He said that his firm can build economically for export and claims that it is now possible to build fiberglass vessels of 100 feet or more in length. (The South African Shipping News and Fishing Industry Review, July 1965.)

Note: See Commercial Fisheries Review, Nov. 1964 p. 113; Nov. 1963 p. 79.



South-West Africa

NEW FISHERIES VENTURE INVOLVES' SPINY LOBSTER AND WHITE FISH:

A concession to land and process spiny lobster caught outside the 12-mile fishing limit of South-West Africa has been granted by the South-West Africa Administration to a Walvis Bay businessman. He has also obtained a li-

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South-West Africa (Contd.):

cense from the Administration to catch and process white fish. The white fish license excludes anchovy, mackerel, maasbanker, and pilchard.

The holder of the new concessions plans to organize a spiny lobster firm capitalized at R500,000 (US\$700,000) and a white fish firm capitalized at R2.5 million (US\$3.5 million). Processing plants for the two companies are to be built at Walvis Bay. Private fishing vessels are to be engaged by both companies, although the white fish company may buy and operate a few stern trawlers. Plans call for construction of the new spiny lobster plant to begin in the fall of 1965; construction of the white fish plant will be delayed until necessary processing machinery arrives in the spring of 1966.

Speaking of white fish, the sponsor of the new venture pointed out the strong export market and said, "We hope eventually to be able to handle at least 1,000 tons a month at Walvis Bay." (The South African Shipping News and Fishing Industry Review, July 1965)



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TUNA FISHING TRENDS IN THE INDIAN OCEAN, MID-1965:

Early in May 1965, the Soviet tuna factory vessel Leninskii Luch completed her maiden voyage and returned to her homeport at Vladivostok after a 7-months expedition to the Indian Ocean. About 800 metric tons of tuna were caught and canned. Another Soviet tuna vessel, the Krasnii Luch, also completed an Indian Ocean trip in the summer of 1965 and returned to Sevastopol on the Black Sea with 530 metric tons of tuna. The Krasnii Luch fished off the coasts of Somalia and Madagascar.

EXPEDITION SENT TO EXPLORE FOR TUNA, SARDINES, AND MACKEREL IN THE EASTERN PACIFIC:

In September 1965, a large group of Soviet scientists was ready to leave Vladivostok aboard 5 research vessels for a major fishery research cruise in the Eastern Pacific Ocean. Explorations from Canada to Chile are plan-

ned. The main purpose of the cruise is to discover new resources of tuna, sardines, and mackerel. The flagship of the expedition is the factory stern trawler Lira. The participating scientists are members of the Soviet Pacific Scientific Research Institute for Fisheries and Oceanography (VNIRO) and of the Leningrad Institute of Zoology. The cruise is to last over 6 months. The Soviet scientists plan to call at ports in Canada, Mexico, Chile, Western Samoa, and the Fiji Islands.

FAR EAST FISHERIES DEVELOPMENTS:

Soviet fishing vessels assigned to the Far East Region, beginning this summer, beganto employ gill nets to harvest herring, according to a report in a Soviet periodical dated August 19, 1965. Formerly, they used surrounding nets but they were found to be effective only when dense herring schools were present. The use of gill nets has made it possible for the Far East fleet to begin fishing for herring a month earlier than usual. Also, the Soviet fleet has succeeded in mechanizing operations through the use of "net shakers" to shake out the herring from the gill nets. Some vessels operating in the northern part of the Okhotsk Sea caught from 300-400 kilograms (660-880 pounds) of herring per shackle per night set.

A Soviet factoryship assigned to the Sakhalin Administrative Province, Far East Region, reached her production target in late August 1965 and canned over 5 million cans of saury, pink salmon, and kelp. (Suisancho Nippo, September 3, and 4, 1965.)

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EXPLORATORY CRUISE TO THE TROPICAL ATLANTIC AND THE ANTARCTIC:

An 8-months exploratory cruise to the tropical Atlantic and the Antarctic was completed in early August 1965 by the Akademik Knipovich, the Soviet Union's largest and most modern fisheries research vessel. Described as a floating laboratory, it can also operate as a stern trawler-factoryship.

Sailing from Sevastopol in December 1964 with a party of over 30 scientists, the vessel conducted research off North Africa in the spring of 1965. Exploratory fishing for tuna off Angola occupied the vessel in May 1965. The latter part of the cruise took the vessel

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south to Antarctic waters and then north to the Patagonian Shelf of South America. During the past phase of the cruise, a party of scientists from Uruguay boarded the Akademik Knipovich and took part in joint research on the Continental Shelf near Uruguay.

Launched in mid-1963 and tested during 1964, the Akademik Knipovich is classified by the Soviets as a "scientific and processing" vessel. It is equipped with 12 research laboratories as well as canning and freezing equipment. The vessel returned to its home port on the Black Sea in August 1965.

Note: See Commercial Fisheries Review, Jan. 1964, p. 73, and Oct. 1962 p. 67.

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AVERAGE ANNUAL CATCH OF LARGE REFRIGERATOR-TRAWLERS:

Large refrigerated and freezer trawlers of the Soviet Union land an average annual catch of 7,500 metric tons (16.5 million pounds) and pay for themselves in 2 or $2\frac{1}{2}$ years, according to the Soviet Fisheries Minister. He emphasized that the main trend in their fishing industry is development of increased automation in the catching and processing of fish. (United States Embassy, Moscow, July 22, 1965.)

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FACTORYSHIPS BUILT IN WEST GERMANY FOR SOVIETS:

The Rybatskaja Slava, first in a series of eight fish factoryships ordered by the Soviet Union from a German shipyard in Kiel, was delivered July 28, 1965, after a year of outfitting and trial runs. The Morskaja Slava, 4th of the series, and the 33rd vessel built by the German yard for the Soviet Union since 1954, was launched July 20, 1965. One of the remaining four factoryships to be built will be completed each quarter until the DM 250 million (US\$62,5 million) contract is fulfilled at the end of 1966.

The specifications of the factoryships are: capacity 16,000 gross registered tons, length 382.5 feet, main diesel engine 5,640 horse-power, and top speed 14 knots. Each is to be manned by a crew of 270.

The factoryships will pick up trawl catches either directly from the vessels or from

cod ends left floating on the sea. Designed to stay at sea almost indefinitely, the factoryships carry fuel and water for the trawlers, provide medical, dental, and recreational facilities for their crews, and process their catches into a variety of products. Each factoryship can handle 400 metric tons of raw fish daily, processing it into frozen fish fillets, canned fish, fish meal, and cod-liver oil. Up to 10,000 tons of processed fish can be stored on board. The factoryships will in turn be serviced by a fleet of refrigerated transport vessels which will deliver supplies and carry the processed fish to the Soviet Union. Reportedly the factoryships will serve in the North and South Atlantic. (United States Consulate, Hamburg, August 6, 1965.)

FREEZER-TRAWLER "GLETCHER" DELIVERED TO SOVIETS

BY DANISH SHIPYARD:

The 2,570-ton freezer-trawler M/S Cletcher was delivered to V/O Sudoimport, Moscow, by a Copenhagen shipyard, July 27, 1965.
Launched November 26, 1964, the vessel is part of a series of 15 freezer-trawlers for the U.S.S.R. being built by the Danish shipyards to the following specifications: length

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The 2,570-ton freezer-trawler M/S Gletcher, a refrigerator vessel that can also be used as a trawler.

between perpendiculars 91 meters (298,5 feet), breadth 16 meters (52,5 feet), and deadweight tonnage 2,550 to 2,600 metric tons. The first in the series was the M/S Skryplev launched May 10, 1962. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, August 4, 1965.)

Note: See Commercial Fisheries Review, Sept. 1965 p. 76, and Feb. 1965 p. 80.

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ATLANTIC TRAWLER CATCH RATE DECLINE FORECAST:

The Lowestoft Fisheries Laboratory of the British Government has published a report entitled Future Prospects in the Distant-water Fisheries in which the effect of increasing world fishing on Atlantic fishery stocks is forecast. The report reviews the entire Atlantic Ocean by fishing grounds as well as by major commercial species. Methods of fishing and types of vessels are also considered.

The main conclusions reached by the British scientists are:

- (1) Increasing world demand for fishery products will increase the pressure on available Atlantic fishery resources and will result in decreased catch rates.
- (2) Conventional side trawlers are rapidly replaced by freezer stern trawlers, factoryships, and motherships. The building of conventional side trawlers has been entirely stopped in West Germany and will soon end in the United Kingdom. A similar trend is evident in Poland, the Soviet Union, and East Germany.
- (3) Few unexploited fishing grounds remain, Even the lightly fished stocks on South African and South American (Patagonian) shelves are supporting substantial catch rates. Any sharp increase in fishing effort on those shelves is bound to result in a declining catch rate. The decline may be rapid and sharp.
- (4) The large increase in factoryship and mothership operations will soon lead to a rather equal distribution of catch effort per hour on all known Atlantic fishing grounds. At present catch rates, Newfoundland fishing grounds are most attractive to freezer and factory trawlers; those of Labrador and West Greenland are only slightly less attractive. An increase of fishing effort is likely to occur on all three of those fishing grounds.
- (5) The total international catch is higher than ever in the Atlantic although the catch per unit of effort is falling to a level which may soon become unprofitable for the free-enterprise fishing fleets. (Fishing News, July 23, 1965, and other sources.)

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NEW ANGLO-ARABIAN SHRIMP FISHING VENTURE IN MIDDLE EAST:

A new company to develop a shrimp fishing and processing industry in the Middle East was formed by a large British food company and a Jordanian businessman.

The headquarters of the new company will be in Bahrain in the lower Persian Gulf off the coast of Saudi Arabia where the local management will be responsible for full-scale operations before the end of 1965.

The new company has signed an agreement with officials in Saudi Arabia for exclusive rights to some productive shrimp fishing waters in the Middle East. Plans of the new company include exporting frozen shrimp to the United States. (Fish Trades Gazette, July 31, 1965.)

EXTENDED BRITISH FISHING LIMITS STIR PROTESTS AMONG FRENCH HERRING FISHERMEN:

In September 1965, British newspapers reported protests by French herring fishermen against Britain's extended 12-mile fishery limits (which became effective September 30, 1964). The French fishermen claimed they were excluded from certain areas within the British limits in which other nations were allowed to fish.

The situation apparently involves habitual fishing rights. Under the European Fisheries Convention, France and certain other countries were given the right to claim fishing privileges within Britain's 6- to 12-mile coastal zone, but only for the stocks and on the grounds which they had habitually fished for 10 years ending in 1963.

France and Poland were granted habitual fishing rights for herring off the British east coast north of Whitby. The French protests were said to arise from the fact that the herring schools had moved south of Whitby into an area in which the French had not habitually fished and to which, therefore, they had no right of access. (United States Embassy, London, September 15, 1965.)

MARINE FISH FARMING EXPERIMENTS IN SCOTTISH BAYS:

Fish farming experiments at sea are being carried out on a small scale in Scottish bays un-

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der the sponsorship of the British White Fish Authority. Some 200,000 young plaice of postage-stamp size, artificially hatched and reared at Port Erin, Isle of Man, have been released into a 5-acre holding pond at Ardtoe on the coast of Northern Argyll. Among the problems encountered have been the depredations of small crabs. (The crabs are being trapped.) More serious is an excessive influx of fresh water from the surrounding hills. The White Fish Authority emphasized that the object of the experiment in its early stages was to identify and attempt to overcome problems such as those.

In July 1965, a spokesman for the Authority said that Scottish bays were well suited for such experiments. He pointed out that increased fishing and an increasing demand for fish in the future could cause scarcities. Fish farming at sea might be one solution to the problem. He said that scientific experiments of recent years give hope that fish farming at sea may become a reality not too many years from now. (Fishing News, London, July 16, and August 20, 1965.)

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SMALL VESSEL DESIGN RECOMMENDA-TIONS FOR STABILITY AND ECONOMY:

Papers on the design, construction, and operation of small fishing vessels were given at a conference held in Newfoundland, Canada. Among the contributors was a specialist from the National Physical Laboratory, Teddington, England, who commented on British fishing vessels in relation to stability and economy of operations.

Fishing vessels of all types, he said, had traditionally earned a good reputation for seaworthiness and the ability to work in diverse weather conditions. Technically, the relatively high speed of fishing vessels in relation to their short length has made them of special hydrodynamic interest.

The wave-making resistance of fishing vessels is therefore of more than average importance. Relatively minor changes in hull form and dimensions may require radical changes in power and length.

As a result of studies which have been made of vessels under 100 feet in length, the British designer claims that it is possible to predetermine to a large extent the best underwater hull form and dimensions for specified operating conditions, and to assess the quality of performance of any vessel in relation to optimum result.

A relatively large scope for improvement in many traditional designs of fishing vessels is very possible, he said, using those techniques.

The British designer said there were clear indications that fishing vessels were being built beyond the economic lengths and speeds which could be justified on the current fishcatching rates.

He based that conclusion on design theory as well as on a survey of British fishing vessels. For example, an increase of speed beyond about 15 knots resulted in diminishing increases in fishing time. Although increasing the speed beyond 15 knots did increase the ratio of fishing time to voyage time, and also reduced the length of the voyage, the corresponding power required to maintain those higher speeds was generally excessive and produced high fuel and maintenance costs.

In an effort to reduce resistance and power requirements per ton of displacement, larger vessels up to 190 feet between perpendiculars had been built by some owners at extra capital cost. But those larger vessels had to catch far greater quantities in the same time if they were to give the same economic return, and they had not done so since fish catching rates were not significantly greater for the larger vessels with the present type of gear.

Accordingly, the British expert thought there was likely to be a sustained requirement for well designed stern trawlers of between 130 and 150 feet between perpendiculars. (Fishing News, July 30, 1965.)

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LIGHTWEIGHT PLASTIC FISH BOXES TO BE PRODUCED:

Lightweight plastic fish boxes are to be produced by one of the largest plastic-molding machines ever built in Great Britain. The machine can produce moldings weighing up to 30 pounds. The fish boxes will be molded in high density polythene, each weighing $8\frac{1}{2}$ pounds and holding about 112 pounds of fish and ice.

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The machine was designed by a Bourne-mouth engineering firm and is being built at a factory in Birmingham. (Fish Trades Gazette, July 24, 1965.)

OCEANOGRAPHIC CRUISE TO USE "SOUND PICTURES" TO STUDY PLANKTON:

An oceanographic cruise to study plankton was begun in early September 1965 when biologists and physicists from several nations sailed from Plymouth, England, aboard the research vessel Discovery III for a 3-months cruise in the Atlantic. The cruise is a cooperative effort involving scientists from the United States, Brazil, and Portugal, as well as the United Kingdom. The U.S. National Science Foundation contributed funds to help outfit the cruise. Echo-sounding devices are the main tool being used during the investigation. (Editor's Note: According to previous reports, British scientists have developed an underwater "sound wave searchlight" that gives a much more detailed picture of the underwater world than traditional echosounding equipment.)

Scientists aboard the <u>Discovery III</u> hope to gain a better understanding of the way in which various types of plankton layers reflect sound. One of their objectives is to develop improved techniques of identifying different types of plankton layers with echo-sounding devices. A better understanding of the layers could tell much about the distribution and behavior of the tiny sea animals and plants (plankton) which are a primary source of food for all marine life. It is probable that some layers would also be a useful index of internal waves and other aspects of the physical structure of the ocean.

Studies of the relation of plankton and light were also scheduled during the cruise of the <u>Discovery III</u>. Some of the scattering layers are known to alter their depth in relation to the intensity of light, so attempts will be made to influence plankton movement with artificial light. The frequency and intensity of the responses of the eyes of the various organisms in the scattering layers will be studied, and measurements will be made of the light generated by luminescence of the organisms.

During the cruise, echo-sounders will operate at seven different frequencies and the scale of each will be determined so that some measure of quantity can be given to the sound reflections from organisms. A blending device will make it possible to obtain some measure of the patchiness of sound reflections at any given frequency and to compare the total intensity of scattering in a selected plankton layer in different positions. Records will also be taken on high-speed recorders. (Fishing News, London, September 10, 1965.)

Note: See Commercial Fisheries Review, January 1965 p. 96.



Uruguay

FISHERIES PROJECT PROPOSED BY BULGARIA:

Bulgaria is said to have offered to build fish-canning and cold-storage plants in Uruguay. The installations would be paid for by Uruguayan shipments of agricultural products to Bulgaria. Uruguay doesn't appear to have the fishing capability to take full advantage of the offer. If built, however, the plants might give Bulgaria, or another Soviet Bloc country, a base for fishing operations on the Patagonian Shelf of South America. Production facilities might also create a market for fishing vessels in Uruguay.



Venezuela

JAPAN REDUCES HOLDING IN JOINT TUNA ENTERPRISE:

The vice-governor of Chiba Prefecture revealed in late August 1965 that the Chiba Prefectural Fisheries Promotion Company has relinquished management of the joint Japanese-Venezuelan tuna fishing enterprise (Flota Pesquera de Alta Mar Company) by reducing its stock holdings to about 3 percent. The joint company was established in August 1959 with Japan contributing 49 percent and Venezuela 51 percent of the investment capital. (Suisancho Nippo, September 2, 1965.)

SHRIMP INDUSTRY OPPOSES ENTRY OF FLORIDA FIRM:

Venezuelan opposition has been building up against a proposal by a Florida company to establish a modern shrimp packing plant in Zulia State in Western Venezuela. Packers in Vene-

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Venezuela (Contd.):

zuela have obtained support from State agencies, local and national labor groups, and some trade associations for their plea to exclude the planned operation. The local groups insist that the national shrimp industry would be jeopardized by the proposed new company. (United States Embassy, Caracas, September 18, 1965.)



SHRIMP-VEGETABLE PLATTER

There are certain old "dowagers" among the sauces -- those that derive their thickening from a flour paste. Then there are the aristocrats of sauces that get their stamina from eggs. Some of the latter, such as hollandaise, are thickened by heating; others, of which mayonnaise

is the best known, are thickened by beating or whipping. This savory mustard sauce for shrimp falls into the latter category. Many cooks shy away from sauces of this type, but in truth they are the easiest of all because the whole operation requires only one bowl. Mustard sauce makes an excellent accompaniment for this shrimp and vegetable platter.

SHRIMP-VEGETABLE PLATTER WITH TARRAGON MUSTARD SAUCE

1½ pounds frozen peeled and deveined shrimp

1 package (10 oz.) frozen Brussels sprouts

1 package (10 oz.) frozen whole baby carrots 2 cups sliced celery 1 (1-lb.) can whole

potatoes

Cook shrimp in boiling salted water to cover for 3 to 5 minutes or until bright pink and tender. Meanwhile, cook frozen Brussels sprouts and frozen carrots as directed; cook celery inboiling salted water until tender. Heat pota-



Shrimp and vegetable platter with tarragon mustard sauce.

toes. Arrange shrimp in a cross on a large chop plate. In each "V" of the cross, place one of the drained vegetables. Serve with Tarragon Mustard Sauce. Makes 6 servings.

Tarragon Mustard Sauce

2 tablespoons dry mustard

6 tablespoons white wine or beer

1 cup salad oil

2 egg yolks

2 tablespoons lemon juice

1 teaspoon salt

2 tablespoons dried tarragon

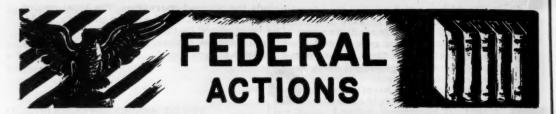
Mix mustard and wine or beer to make a smooth paste. Let stand at room temperature for 10 minutes to develop flavors. Beat in egg yolk with wire whisk. Add oil gradually, beating vigorously. Add lemon juice, salt, and tarragon; chill. Garnish with fresh tarragon. (J. Walter Thompson Co., New York City, and Shrimp Association of the Americas.)

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Department of Commerce

AREA REDEVELOPMENT ADMINISTRATION SUCCEEDED BY THE ECONOMIC

DEVELOPMENT ADMINISTRATION:

On August 31, 1965, the Area Redevelopment Administration (ARA) ceased operations and was succeeded by a new Federal agency, the Economic Development Administration (EDA). As was the case with ARA, the new agency will function as a unit of the Department of Commerce. The new agency will administer a greatly expanded program of public works loans and grants, industrial and commercial loans, and technical assistance to promote economic development of depressed communities and regions across the country. (U. S. Department of Commerce, August 31, 1965.)

Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

PROPOSAL TO USE SODIUM NITRITE AS A PRESERVATIVE AND COLOR FIXATIVE IN CANNED CRAB MEAT:

A petition (FAP 6A1829) has been filed by a firm in Port Royal, S. C., proposing an amendment to the regulations of the U. S. Food and Drug Administration governing the use of sodium nitrite as a food additive. The petition proposes the "use of sodium nitrite as a preservative and color fixative in canned crab meat at a level not to exceed 250 parts per million." The petition was published in the Federal Register, August 31, 1965.



Department of the Interior

FISH AND WILDLIFE SERVICE

BUREAU OF COMMERCIAL FISHERIES

FISHERY LOAN APPLICATION RECEIVED FOR PURCHASE OF SALMON VESSEL:

Michael J. Carr, Mercer Island, Wash., has applied for a loan from the U. S. Fisheries Loan Fund to aid in financing the purchase of a new 32-foot wood vessel to engage in the fishery for salmon.

Regulations and procedures governing fishery loans have been revised and no longer require that an applicant for a new or used vessel loan replace an existing vessel (Public Law 89-85; Fisheries Loan Fund Procedures-50 CFR Part 250). Complete details of the regulation changes were published in the Federal Register, August 11, 1965.

In accordance with the revised regulations, notice of the application was published in the Federal Register, September 28, 1965. Persons desiring to submit evidence that the contemplated operation of such vessel will cause economic hardship or injury to efficient vessel operators already operating in the salmon fishery were to submit such evidence in writing to the Director, U. S. Bureau of Commercial Fisheries, Washington, D. C., by October 28, 1965.

Note: See Commercial Fisheries Review, October 1965 p. 104.

HEARINGS ON APPLICATIONS FOR FISHING VESSEL CONSTRUCTION DIFFERENTIAL SUBSIDY:

Star-Kist Foods, Inc., Terminal Island, Calif., has applied for a fishing vessel construction differential subsidy to aid in the construction of a 149-foot overall steel vessel to engage in the fishery for tuna, mackerel, sardines, hake, and anchovies. A hearing on the economic aspects of this application was held.

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B. J. Litrico, Tampa, Fla., has applied for a fishing vessel construction differential subsidy to aid in the construction of a 90-foot aluminum vessel to engage in the fishery for shrimp (including royal-red shrimp), spiny lobster, scallops, and Atlantic tuna. A hearing on the economic aspects of this application was held.

The U.S. Bureau of Commercial Fisheries published the notices of the applications and hearings in the Federal Register, September 11, 1965.

CONTRACT AWARDED FOR RESEARCH TO IMPROVE PROCESSING TECHNIQUES FOR ALASKA SEAL SKINS:

A one year contract for a research program designed to make Alaska seal skins more attractive to the public by improving processing techniques has been awarded the Pierre Laclede Fur Company, St. Louis, Mo., announced Secretary of the Interior Stewart L. Udall, September 2, 1965.

That firm will work to develop fur-seal products different from those that have been available. It will seek better ways to dress the leather, develop a variety of colors, improve shearing and other processing techniques, and fashion new luxury fur products. Within 60 days after completing its work, the company will prepare a technical report of its findings. Information on useful new methods will be made public by the Department of the Interior.

Interior's Bureau of Commercial Fisheries manages and harvests the fur seals of the Pribilof Islands, 300 miles off the Alaskan coast in the Bering Sea, and cures the skins before shipping them to a processor. The estimated cost to the Government for performance of the Laclede contract is \$377,000, said that Bureau's director. He said the Government will provide the company 5,000 skins-two-thirds male and one-third female--for research and development purposes. The company's production targets are about 4,000 dressed, dyed and machined furs, and about 1,000 sheared furs. All skins remain the property of the U.S. Government and ultimately will be sold at auction.

On March 31, 1965, the Secretary of the Interior announced the award of a 5-year contract to the Fouke Fur Company of Green-

ville, S. C., for the processing and sale of seven-eighths of the seal skins harvested during the years 1963 through 1967. At the same time, he said the Department would use one-eighth of the skins harvested during the period for experimental processing contracts with other interested firms. The contract with the Pierre Laclede Fur Company is the first of its kind negotiated by the Interior Department.

The Pribilof Islands are the only breeding grounds of the Alaska fur-seal herd, which numbers between 1.5 million and 2 million, and represents more than 80 percent of the world's fur seals. The young are born each summer on the rocky beaches. In the fall, after the breeding season, the seals return to sea. Other seals of the same species breed at rockeries on islands off the coasts of Russia and Japan. Those rockeries are administered by the Soviet Union.

Experts consider the present size of the Alaska herd ideal for its survival and wellbeing. Each year, the United States harvests about 70,000 surplus young animals, of which about 50,000 processed pelts are sold for the United States account. In 1963, gross sales of seal skins brought \$6,066,268. The State of Alaska receives 70 percent of the net proceeds from the semiannual fur-seal auctions.

Under terms of the North Pacific Fur Seal Convention of 1957, Canada and Japan each receive 15 percent of the annual separate harvests of the United States and the Soviet Union.

Note: See Commercial Fisheries Review, July 1965 p. 101.



Department of Labor

WAGE AND HOUR AND PUBLIC CONTRACTS DIVISIONS

FISH FARMING ENTITLED TO AGRICULTURAL EXEMPTION UNDER FAIR LABOR STANDARDS ACT:

The agricultural exemptions applicable under the Fair Labor Standards Act to employees engaged in fish farming were clarified by amendments to the Code of Federal Regulations, Title 29--Labor, Part 780--Exemption Applicable to Agriculture, Processing of Agricultural Commodities, and Related Subjects. The amendments as published in the Federal Register, August 10, 1965, include

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fish farming activities within the scope of the meaning of "farming in all its branches." The amendments became effective upon publication. In essence, employees engaged in propagating or farming of fish qualify for exemption from the minimum wage and overtime provisions under section 13(a)(6) of the Fair Labor Standards Act as stated in section 780.118 as well as under section 13(a)(5) as explained in Part 784 of this same chapter.



Eighty-Ninth Congress (First Session)



Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House

and Senate, as well as signature into law or other final disposition are covered.

ANADROMOUS FISH CONSERVATION: House Committee on Merchant Marine and Fisheries, Sept. 15, 1965, reported (H. Rept. 1007) on H. R. 23, to authorize the Secretary of the Interior to initiate a program for the Conservation, development, and enhancement of the Nation's anadromous fish in cooperation with the several States, with amendment; to Committee of the Whole House on the State of the Union.

H. Rept. 1007, Authorizing the Secretary of the Interior to Initiate a Program for the Conservation, Development, and Enhancement of the Nation's Anadromous Fish (Sept. 15, 1965, report from the Committee on Merchant Marine and Fisheries, House of Representatives, 89th Congress, 1st session, to accompany H. R. 23), 24 pp., printed. Committee reported bill favorably with amendments. Presents purpose, need for legislation, background, section-by-section analysis, cost, changes in existing law, and departmental reports.

House Sept. 20, 1965, amended and passed H. R. 23. As passed would provide a 5-year program (spending over that period \$25 million of Federal money to be equally matched by State or private agencies) to clear streams, study habitat and resources, build fishways, and accomplish other necessary actions to provide for the restoration of the fish. The title was amended: "To authorize the Secretary of the Interior to initiate with the several States a cooperative program for the conservation, development, and enhancement of the Nation's anadromous fish, and for other purposes."

On Sept. 21, 1965, the House-passed H. R. 23 was referred to the Senate and its Committee on Commerce.

Senate Committee on Commerce, Oct. 8, 1965, ordered favorably reported with amendments H. R. 23, and reported (S. Rept. 860) it to Senate Oct. 11.

AQUATIC PLANT CONTROL: H. Doc. 251, Expanded Project for Aquatic Plant Control: Letter from the Secretary of the Army, transmitting a letter from the Chief of Engineers, Department of the Army, Dated June 2, 1965, Submitting a Report, Together with Accompanying Papers and Illustrations, on Expanded Project for Aquatic Plant Control, Authorized by Section 104 of Public Law 85-500, 85th Congress, approved July 3, 1958, referred to Committee on Public Works, House of Representatives, 89th Congress, 1st session, July 28, 1965, 161 pp., illus., printed. Contains favor-able report from the Army Chief of Engineers. Besides the report of the division engineers (giving authority, description of harbors, problem, existing projects, analysis of benefits, analysis of remaining problems, con-clusions and recommendations), it contains comments from various Federal agencies, and States of South Car-olina, Alabama, Mississippi, and Louisiana. The report describes the results which have been obtained and recommends that authorization be granted to the Corps of Engineers for continued and expanded work in the con-trol of obnoxious aquatic plants. It is a summary of accomplishments under the Expanded Project for Aquatic Plant Control which was authorized as a pilot program for a five-year period in July 1958 for a study of control of certain obnoxious aquatic plants in the States of Texas, Mississippi, Louisiana, Alabama, Florida, Georgia, South Carolina, and North Carolina. This project was carried out in cooperation with the States, the Agricultural Research Service of the Department of Agriculture, Fish and Wildlife Service of the Department of the Interior, and the Public Health Service of the Department of Health, Education, and Welfare. In-cludes a recommendation that Section 104, Public Law 85-500, 85th Congress, as amended, be further amended to authorize the Secretary of the Army to carry out in cooperation with the States and appropriate Federal agencies a continuing program for the control of obnoxious aquatic plants wherever and whenever infestations of such plants constitute a serious threat to navigation, agriculture, public health, the efficiency of drainage and flood control works, or the use of the Nation's waterways.

CEDAR RIVER HARBOR, MICHIGAN: H. Doc. 248, Letter from the Secretary of the Army, transmitting a letter from the Acting Chief of Engineers, Department of the Army, Dated June 29, 1965, Submitting a Report, Together with Accompanying Papers and a Illustration, on a Review of the Report on Cedar River Harbor, Michigan, requested by resolutions of the Committees on Public Works, United States Senate and House of Representatives, Adopted July 20, 1959 and August 14, 1959 (referred to the Committee on Public Works, House of Representatives, 89th Congress, 1st session, July 26, 1965), 73 pp., printed. Contains report from Acting Chief of Engineers on Cedar River Harbor, Mich., improvements. Besides the report of the district engineer (giving authority, scope, description, improvements desired, plan of improvement), it contains comments from various Federal Agencies, State of Michigan, and report from Board of Engineers for Rivers and Harbors. Among others, discusses benefits for commercial and sport fishing.

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COMMODITY PACKAGING AND LABELING: Fair Packaging and Labeling: Hearings before the Committee on Commerce, United States Senate, 89th Congress, 1st session, on S. 985, a bill to regulate interstate and foreign commerce by preventing the use of unfair or deceptive methods of packaging or labeling of certain consumer commodities distributed in such commerce and for other purposes, Apr. 28, 29, 30; May 3, 4, 5, 6, 7, 17, and 18, 1965, Serial 89-28, 868 pp., illus., printed. Contents include text of bill; agency comments; statements, letters, and telegrams of various business representatives and members of Congress.

CRESCENT CITY HARBOR, CALIFORNIA: H. Doc. 264, Letter from the Secretary of the Army, transmitting a letter from the Acting Chief of Engineers, Department of the Army, Dated June 30, 1965, Submitting a Report, Together with Accompanying Papers and Illustration, on an Interim Report on Crescent City Harbor, California, requested by a resolution of the Committee on Public Works, House of Representatives, A dopted July 31, 1957 (referred to Committee on Public Works, House of Representatives, 89th Congress, 1st session, Aug. 16, 1965), 107 pp., printed. Contains report from the Acting Chief of Engineers, on a review of the reports on Crescent City Harbor, Calif., improve-ments to facilitate navigation. Besides the report of the district engineer (giving authority, scope, description, tributary area, commerce, plan of improvement, shoreline changes, estimates of cost, and benefits, it contains comments from various Federal Agencies, State of California, and reports from Board of Engineers for Rivers and Harbors. Among others, discusses benefits for commercial and sport fishing. District Engineer points out that improvement is needed to deduce damages to lumber and fishing vessels, etc.

FISH AND WILDLIFE: Miscellaneous Fisheries and Wildlife Legislation 1965: Hearings before the Subcommittee on Fisheries and Wildlife Conservation of the Committee on Merchant Marine and Fisheries, House of Representatives, 89th Congress, 1st session, on Fisheries Loans, H. R. 4227, H. R. 5153, H. R. 6090, H. R. 6101, H. R. 6362 and H. R. 6921, May 27, 1965, Pesticide Controls, H. R. 4157, H. R. 4158 and S. 1623, June 22, 1965, Serial No. 89-11, 230 pp., printed. Contains text of the bills, agency reports, and statements of various Federal and State officials, representatives of various business firms, associations, etc.

FOOD STANDARDS--CODEX ALIMENTARIUS COM-MISSION: Sen. Thurmond on Oct. 6, 1965, pointed out in Congressional Record (pp. 25188-25190) that the Codex Alimentarius Commission was established in 1962 under the auspices of the United Nations Food and Agricultural Organization and the World Health Organization for the purpose of devising an international set of standards for food. There are now 45 of the some 100 eligible nations participating in drawing up this code. The work of the Commission is highly important-not only as a means of improving the quality of food for consumers but also as a means of discouraging arbitrary standards as barriers against imports of food products, including imports of U. S. food products. Although the standards will not have legal status when they are adopted by the Commission, they can be expected to exercise a strong influence on the form of national food laws around the world and in discouraging their use as nontariff trade barriers. He also inserted the article: "Standards for Food: A Uniform World Code Is Nearer Despite Some Disputes," published in the Wall Street Journal of Oct. 6. It discusses the work of the Commission; points out that the Commis-

sion is directing its attention to all kinds of standards, not only those relating to the quality of types of food products, but to labeling, methods of analysis, food additives, food hygiene, sampling, and pesticide residues.

FUR SEAL CONSERVATION AND PRIBILOF ISLAND ADMINISTRATION: The subcommittee on Foreign Aid Expenditures of Senate Committee on Government Operations, Sept. 23, 1965, held hearings to review administration of fur seal skin operations in the Pribilof Islands, Alaska. Testimony was received from the Director of the Bureau of Commercial Fisheries, Department of the Interior, who was accompanied by his associates.

HALIBUT COMMISSION: House Committee on Merchant Marine and Fisheries, Sept. 15, 1965, reported (H. Rept. 996) on H. R. 9734, to amend the Northern Pacific Halibut Act in order 1/2 provide certain facilities for the International Pacific Halibut Commission, without amendment; to Committee of the Whole House on the State of the Union.

H. Rept. 996, Offices for the International Pacific Halibut Commission (Sept. 14, 1965, report from the Committee on Merchant Marine and Fisheries, U. S. House of Representatives, 89th Congress, 1st Session, to accompany H. R. 9734), 7 pp., printed. Committee reported bill favorably without amendment. Discusses purpose, background and need for legislation, cost, departmental reports, and changes in existing law.

House Sept. 20, 1965, passed H. R. 9734. House then considered and passed a similar Senate-passed bill, S. 1975. Proceedings for passage of H. R. 9734 were vacated and bill was laid on the table. This action cleared S. 1975 for the President. Authorizes construction of quarters for the Commission on or adjacent to the University of Washington campus; authorizes up to \$500,000 for the construction.

The President Oct. 1, 1965, signed S. 1975 (P. L. 89-233).

HEALTH, EDUCATION, AND WELFARE APPROPRIATIONS, FY 1966: Labor-Health, Education, and Welfare Appropriations for 1966: Hearings before the Subcommittee of the Committee on Appropriations, United States Senate, 89th Congress, 1st session on H. R. 7765, making appropriations for the Departments of Labor and Health, Education, and Welfare, and related agencies, for the fiscal year ending June 30, 1966, and for other purposes. Part 1 (Thursday, Mar. 4, 1965, through Monday, March 22, 1965), and Part 2 (Tuesday, Mar. 23, 1965, through Wed., June 23, 1965), 2,780 pp., printed. Includes statements and budget summaries from the agencies covered, as well as statements from outside witnesses. Includes funds for botulism research under the Food and Drug Administration, water pollution control under Office of the Secretary; pesticide activities, water supply and water pollution control, shellfish sanitation program, and botulism under the Public Health Service.

H. Rept. 791, Departments of Labor, and Health, Education, and Welfare, and Related Appropriation Bill, 1966 (Aug. 12, 1965, report from the Committee of Conference, U. S. House of Representatives, 89th Congress, 1st session, to accompany H. R. 7765), 8 pp., printed. Contains Committee recommendations and statement of the managers on the part of the House.

INLAND GREAT LAKES AND WESTERN RIVERS RULE FOR SMALL VESSELS: S. Rept. 675, Changing

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Inland, Great Lakes, and Western Rivers Rules, Sept. 2 (legislative day, Sept. 1), 1965, report from the Committee on Commerce, U. S. Senate, 89th Congress, 1st session, to accompany S. 1349, 4 pp., printed. Committee reported bill favorably without amendments. Presents purpose, legislative background, a general statement, costs, agency reports, and changes in existing law.

INTERNATIONAL ORGANIZATIONS: H. Doc. 229 (Letter from the Secretary of State, transmitting the 13th Report on the extent and disposition of U. S. Contributions to International Organizations for the Fiscal Year 1964, pursuant to Section 2 of Public Law 81-806; June 28, 1965 referred to Committee on Foreign Affairs, House of Representatives, 89th Congress, 1st session), 154 pp., printed. Lists U. S. contributions to international organizations from fiscal year 1964 funds. Includes a number of international fisheries commissions.

JELLYFISH-CONTROL ELIMINATION IN COASTAL WATERS OF U. S.: Introduced in House H. R. 11475 (Garmatz), Oct. 7, 1965, and H. R. 11507 (Machen), Oct. 8, 1965, to provide for the control of elimination of jellyfish and other such pests in the coastal waters of the United States; to Committee on Merchant Marine and Fisheries. Rep. Garmatz pointed out that bill would authorize the Secretary of the Interior to cooperate with the States and give financial and technical aid to them in the study and control of jellyfish (sea nettles) and other such pests which adversely affect fish and shellfish as well as water-based recreation. The Secretary would be authorized to conduct, either directly or by contract, or both, research into the jellyfish problem, to conduct studies on developing control measures, and, based on such studies, to control or eliminate such pests in our coastal waters and tributaries. The cost of this legislation would be shared by the States on a 50-50 basis, with the Federal share of the program being limited to \$10 million.

MARINE BIOLOGICAL LABORATORY: House Committee on Merchant Marine and Fisheries Sept. 16, 1965, ordered reported favorably to the House S. 1735, to set forth limitations on the use of certain land donated by the University of California for a marine biological laboratory.

METRIC SYSTEM STUDY: Conversion To Metric System: Hearing before the Committee on Commerce, United States Senate, 89th Congress, 1st session, on S. 774, a bill to provide that the Department of Commerce shall conduct a program of investigation, research, and survey to determine the practicability of the adoption by the United States of the metric system of weights and measures, July 14, 1965, Serial No. 89-27, 72 pp., printed. Contents include text of bill, agency comments, statements and letters of various Federal officials, Senators, and representatives of various business firms and associations.

The Metric System: Hearings before the Committee on Science and Astronautics, U. S. House of Representatives, 89th Congress, 1st session, on H. R. 2626 superseded by H. R. 10329, Aug. 2, 3, 4, 5, and 9, 1965, No. 4, 134 pp., printed. Contains testimony of various Federal officials, Congressmen, and representatives from various associations. Would provide that the National Bureau of Standards shall conduct a program of investigation, research, and survey to determine the practicability of the adoption by the

United States of the metric system of weights and measures.

Senate Committee on Commerce Sept. 16, 1965, ordered favorably reported S. 774; same day Committee reported (S. Rept. 751) it to Senate.

S. Rept. 751, Study of Metric System (Sept. 16, 1965, report from the Committee on Commerce, U. S. Senate, 89th Congress, 1st session, to accompany S. 774), 7 pp., printed. Committee reported bill favorably with amendments. Presents purpose, background, provisions, cost, agency comments, and changes in existing law.

Senate Sept. 20, 1965, passed with amendment and cleared for House S. 744. Purpose of the bill is to authorize the Secretary of Commerce to make a 3-year study to determine the advantages and disadvantages of increased use of the metric system of weights and measures in the United States. A complete report to the Congress of the findings, together with appropriate recommendations, is required under the bill. Not to exceed \$500,000 for the first year is authorized for the study.

House Sept. 21, 1965, received a message that the Senate had passed S. 774, and that concurrence of the House was requested.

MINIMUM WAGE: Amendments to the Fair Labor Standards Act: Hearings before the Subcommittee on Labor of the Committee on Labor and Public Welfare, United States Senate, 89th Congress, 1st session, on S. 763, S. 1741, S. 1770, S. 1986, and S. 2210, bills amending the Fair Labor Standards Act of 1938, as amended, Part 1 and Part 2, July 6, 7, 8, 9, 12, 13, 14, 15, and 16, 1965, 1,422 pp., printed. Contains text of the bills, list of witnesses, statements and letters from various Federal officials, Members of Congress, representatives of various business firms, associations, etc.

H. Rept. 871, Fair Labor Standards Amendments of 1965 (Aug. 25, 1965, report from the Committee on Education and Labor, U. S. House of Representatives, 89th Congress, 1st session, to accompany H. R. 10518), 87pp., printed. Committee reported bill favorably without amendment. Contains introductory statement, finding and declaration of policy, subcommittee hearings, history of act, summary of provisions, comments on major provisions, section-by-section analysis, minority views, scope of bill, and views of various Congressmen.

OCEANOGRAPHIC AGENCY OR COUNCIL: National Oceanographic Program Legislation: Hearings before the Subcommittee on Oceanography of the Committee on Merchant Marine and Fisheries, House of Representatives, 89th Congress, 1st session, on H, R, 921, H, R, 2218, H, R, 3310, H, R, 3352, H, R, 5175, H, R, 5654, H, R, 5884, H, R, 6009, H, R, 6457, H, R, 6512, H, R, 7301, H, R, 7798, H, R, 7849, H, R, 9064, H, R, 9483, H, R, 9617, H, R, 9667, H, R, 10432, and S, 944, Aug. 3, 4,5, 10, 11, 12, 13, 17, 18, and 19, 1965, Serial No. 89-13, 648 pp., printed. Contains texts of the bills, agency reports, statements from various Federal and State officials, Congressmen, and others.

House Committee on Merchant Marine and Fisheries Sept. 16, 1965, reported favorably to House S. 944 (amended), to provide for expanded research and development in the marine environment of the U. S., to establish a National Council on Marine Resources and

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Engineering Development, and a Commission on Marine Science, Engineering and Resources.

Committee Sept. 17, 1965, reported (H. Rept. 1025) bill to House, with amendment; to Committee of the Whole House on the State of the Union.

House Sept. 20, 1965, amended and passed S. 944. House-passed bill was returned to the Senate. Title was amended: "To provide for a comprehensive, longrange, and coordinated national program in marine science, to establish a Commission on Marine Science, Engineering, and Resources, and for other purposes."
(1) It is cited as the "Marine Resources and Development Act of 1965." (2) Makes a clear declaration of national policy. (3) Sets forth some eight objectives to which the marine science activities should contribute. (4) Prescribes the duties and responsibilities of the President for the development, maintenance, and administration of marine science activities in the U-nited States. (5) Would direct the President to establish a self-liquidating Commission on Marine Science, Engineering, and Resources to "made a comprehensive investigation and study of all aspects of marine science in order to recommend an overall plan for an adequate national oceanographic program that will meet the present and future national needs." The Commission is to make its final report within 18 months after its establishment. (6) Would require the President to submit annual reports to the Congress in connection with the Federal Government's activities in marine sciences, including recommendations for legislation and estimates of costs. (7) Would broadly define the terms "marine science" and "marine environment." (8) Would authorize the appropriation of such sums as may be necessary but provide a limitation of not to exceed \$1.5 million per year. (9) Oceans and Great Lakes would be included in the program. Such funds would be used to strengthen the staffing of the Interagency Committee on Oceanography as well as finance the activities of the Commission. As passed by the House the bill contains most of the Senate version. The principal differences are that the House committee amendment does not authorize the establishment of a statutory Cabinet-level-Council--with assignment of responsibilities at the discretion of the President. It places those responsibilities directly on the President. Other major differences between the two versions is that the appointment of the Commission is entirely discretionary under the Senate bill, while it is mandatory under the House version.

H. R. 11159 (Wydler) introduced in House Sept. 20, 1965, to provide for a comprehensive, long-range, and coordinated national program in oceanography, and for other purposes; to Committee on Merchant Marine and Fisheries.

The Senate Sept. 21, 1965, received a message that the House had passed \underline{S} , $\underline{944}$ and requested the concurrence of the Senate.

Rep. Keith in extension of remarks in Congressional Record, Sept. 24, 1965 (pp. A5428-A5429) inserted this editorial which appeared in the Sept. 24 edition of the Washington Post: "To Study Marine Science." The editorial praises the legislative efforts in behalf of the ocean sciences and suggests that the conferees adopt the amendments passed by the House.

Rep. Matsunaga in extension of remarks in Congressional Record, Oct. 1, 1965 (pp., A5546-A5547)

pointed out that speed must necessarily characterize the implementation of S. 944, and that we must make immediate use of all of our existing resources. He also inserted in the Record the article. "A Billion A Year In Oceanics," from the Sept. 18, 1965, issue of the Honolulu Star-Bulletin. Article discusses potentialities that Hawaii has to offer in our national marine resources development effort.

ORDERLY MARKETING: H. R. 11454 (Flood) introduced in House Oct. 6, 1965, to provide for the orderly marketing of articles imported into the United States, to establish a flexible basis for the adjustment by the U. S. economy to expanded trade, and to afford foreign supplying nations a fair share of the growth or change in the U. S. market; to the Committee on Ways and Means

PESTICIDES AND FISH AND WILDLIFE: House Committee on Merchant Marine and Fisheries, Sept. 14, 1965, reported (H. Rept. 1002) on S. 1623, to amend the act of Aug. 1, 1958, relating to a continuing study by the Secretary of the Interior of the effects of insecticides, herbicides, fungicides, and other pesticides upon fish and wildlife for the purpose of preventing losses to this resource, without amendment; to Committee of the Whole House on the State of the Union.

H. Rept. 1002, Protection of Fish and Wildlife from Pesticides (Sept. 14, 1965, report of the Committee on Merchant Marine and Fisheries, U. S. House of Representatives, 89th Congress, 1st session, to accompany S. 1623), 7 pp., printed. Committee reported bill favorably without amendment. Discusses purpose, background, need for legislation, cost, and changes in existing law.

House Sept. 20, 1965, passed S. 1623. This cleared the bill for the President. Would impose a 3-year limitation on what otherwise was a program that was openeded insofar as time is concerned; raise the money authorized for research into the effects of pesticides on fish and wildlife from \$2,565,000 to \$3,200,000 for the first year, and then to \$5 million for each of the next 2 years.

The President Oct. 1, 1965, signed S. 1623 (P. L. 89-232).

STATE DEPARTMENT APPROPRIATIONS FY 1966: Departments of State, Justice, and Commerce, the Judiciary, and related Agencies Appropriations, 1966: Hearings before the Subcommittee of the Committee on Appropriations, United States Senate, 89th Congress, 1st session, on H. R. 8639, making appropriations for the Departments of State, Justice, and Commerce, the Judiciary, and related Agencies for the Fiscal Year ending June 30, 1966, 1,004 pp., printed. Contains testimony and statements from various Federal officials and members of Congress. Included under the State Department are funds for the various International Fisheries Commissions.

H. Rept. 807, Departments of State, Justice, and Commerce, the Judiciary, and related agencies appropriation bill, 1966 (Aug. 18, 1965, report from the Committee of Conference, U. S. House of Representatives, 89th Congress, 1st session, to accompany H. R. 8639), 5 pp., printed. Committee reported favorably with various amendments. Contains statement of the managers on the part of the House.

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STERN RAMP TRAWLERS: H. R. 11185 (Bates) introduced in House Sept. 21, 1965, to authorize the Secretary of the Interior to construct two modern stern-ramp trawlers to be used for experimental, commercial fishing, research, and for other purposes; to Committee on Merchant Marine and Fisheries.

S, 2589 (Magnuson and 3 others) introduced in Senate Oct. T, 1965, to authorize the Secretary of the Interior to construct two modern stern-ramp trawlers to be used for experimental, commercial fishing, research, and for other purposes; to the Committee on Commerce. Sen. Magnuson in Congressional Record, Oct. 1, 1965 (pp. 24902-24903) pointed out that this proposed legislation will authorize the Secretary of the Interior to build two factory-processing trawlers for experimental harvesting and processing of fishery resources. Under the bill, the Secretary is authorized to operate the vessels or he may charter the vessels to private operators. Conditions have been placed in the legislation which will assure that the operation of the vessels will not have an adverse effect upon domestic fishery prices or current market demand.

TECHNOLOGICAL LABORATORY LAND IN MARY-LAND: Subcommittee on Mines and Mining of House Committee on Interior and Insular Affairs Sept. 14, 1965, approved for full committee action H. R. 9334 (amended), to provide for the conveyance of certain real property of the United States to the State of Mary-land. Property affected includes the site of the Bureau of Commercial Fisheries Technological Laboratory, College Park, Maryland. Full Committee Sept. 15 ordered bill reported favorably; Sept. 16 reported (H. Rept. 1013) bill to House.

H. Rept. 1013, Providing for the Conveyance of Certain Real Property of the United States to the State of Maryland (Sept. 16, 1965, report from the Committee of the Whole House on the State of the Union, to accompany H. R. 9334), 4 pp., printed. Committee reported bill favorably with amendments. Discusses purpose, need, cost, departmental recommendations, and committee recommendation.

House Sept. 20, 1965, passed H. R. 9334. House then considered and passed a similar Senate-passed bill, S. 1988. Proceedings for passage of H. R. 9334 were vacated and bill was laid on the table. This action cleared S. 1988 for the President.

The President Oct. 1, 1965, signed <u>S</u>. <u>1988</u> (<u>P. L</u>. 89-227).

VESSEL MEASUREMENT: S. Rept. 677, Admeasurement of Small Vessels, September 2 (legislative

day, September 1), 1965, report from the Committee on Commerce, U. S. Senate, 89th Congress, 1st session, to accompany S. 2142), 8 pp., printed. Committee reported favorably with amendments. Presents the purpose, legislative background, a general statement, an analysis, changes in existing law, and agency reports.

WATER POLLUTION CONTROL ADMINISTRATION: Conferees, Sept. 14, 1965, in executive session, agreed to file a conference report on the differences between the Senate- and House-passed versions of S. 4, to amend the Federal Water Pollution Control Act, as amended, to establish the Federal Water Pollution Control Administration, to provide grants for construction of municipal sewage treatment works, to authorize the establishment of standards of water quality to aid in preventing, controlling, and abating pollution of interstate waters, and for other purposes. Committee of Conference Sept. 17 reported (H. Rept. 1022) bill out.

H. Rept. 1022, Water Quality Act of 1965 (Sept. 17, 1965, report from the Committee of Conference, House of Representatives, 89th Congress, 1st session, to accompany S. 4), 14 pp., printed. Committee recommended that Senate recede from its disagreement to the amendment of the House to the text of the bill and agree to same with amendment. Includes statement of managers on the part of the House.

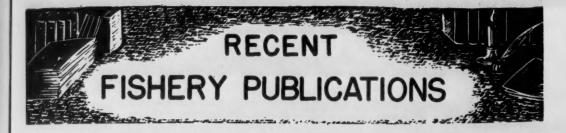
House Sept. 21, 1965, adopted the conference report on <u>S</u>. 4, the Water Quality Act of 1965, and sent the bill to the Senate. The Senate also adopted the conference report, thus clearing the bill for the President's signature. Makes several important changes in the Federal water pollution control program. Provides for an additional Assistant Secretary of HEW and an administrator to guide the program, which is removed from the Public Health Service; adoption of water quality criteria applicable to interstate waters; standards of water quality to be such as to protect the public health or welfare and enhance water quality; establishing a policy and purpose for the Act; a four-year, \$80 million program for demonstration grants on controlling pollution from sewers; increased Federal grants to municipalities for building waste treatment plants.

The President Oct. 2, 1965, signed S. 4 (P. L. 89-234). Sen. Boggs inserted in <u>Congressional Record</u>, Oct. 4, 1965 (pp. 24998-24999) the article "The Economics Of A New Pollution Control Policy" by Gershon Fishbein, from the Oct. 3, 1965, issue of the <u>Washington</u> <u>Star</u>.

WHALING: Sen Bartlett inserted in Congressional Record, Sept. 30, 1965 (pp. 24658-24661), an article by Noel Simon, entitled "Of Whales and Whaling," from the August 27, 1965, issue of Science.



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FISH AND WILDLIFE SERVICE **PUBLICATIONS**

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SL - STATISTICAL LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
SSR.- FISH. - SPECIAL SCIENTIFIC REPORTS.-FISHERIES (LIMITED
DISTRIBUTION).

Title CFS-3848 - Frozen Fishery Products, June 1965, 8 pp.

CFS-3855 - Michigan, Ohio & Wisconsin Landings, March 1965, 4 pp.

CFS-3865 - New Jersey Landings, May 1965, 3 pp. CFS-3867 - Fish Sticks, Fish Portions, and Breaded Shrimp, April-June 1965, 3 pp. CFS-3869 - Maryland Landings, April 1965, 4 pp. CFS-3873 - Fish Meal and Oil, June 1965, 2 pp. CFS-3878 - Rhode Island Landings, March 1965, 3 pp.

CFS-3879 - Massachusetts Landings, January 1965, 5 pp. CFS-3881 - Louisiana Landings, May 1965, 3 pp.

CFS-3885 - Florida Landings, June 1965, 8 pp.

SL-10 - Wholesale Dealers in Fishery Products, Mary-land, 1964 (Revised), 9 pp.

Firms Canning Fishery Products, 1964 (Revised): SL-102A - Pacific Sardines, 1 p.

SL-103 - Tuna, 2 pp.

SL-103A - Tunalike Fishes, 1 p.

SL-104 - Mackerel, 1 p.

SL-105 Alewives, 1 p.

- Shad, 1 p. SI .- 106

SL-110 Oysters, 2 pp

SL-118 Groundfish Flakes, 1 p.

SL-119 Squid, 1 p.

- Anchovies, 1 p. SL-120

Sep. No. 742 - Pasteurization of Fishery Products with Gamma Rays from a Cobalt-60 Source.

Sep. No. 743 - Construction and Operation of the "Cobb" Pelagic Trawl (1964).

FL-578 - Haddock, by Albert C. Jensen, 7 pp., illus., June 1965. Covers the occurrence and commercial value of the haddock (Melanogrammus aeglefinus), and its spawning and early life, growth, age determination, commercial otter-trawl fishery, market utilization, and biological research.

SSR-Fish. No. 509 - Laboratory Evaluation of the 1-on-10 Slope Ice Harbor Fishway Design, by Clark S. Thompson and Joseph R. Gauley, 23 pp., illus., June 1965.

SSR-Fish. No. 511 - Evaluation of Biological Stains, Inks, and Fluorescent Pigments as Marks for Shrimp, by Edward F. Klima, 8 pp., illus., May 1965.

SSR-Fish, No. 512 - Hypotheses on the Origin of Exploited Skipjack Tuna (Katsuwonus pelamis) in the Eastern and Central Pacific Ocean, by Brian J. Rothschild, 20 pp., illus., April 1965.

SSR-Fish, No. 519 - Biological Investigations of Purse Seine Fishery for Atlantic Menhaden, by Kenneth A. Henry, 15 pp., illus., July 1965. After record catches in 1961 and 1962 of about 2.3 billion pounds of menhaden (Brevoortia species), the United States catch declined to about 1.5 billion pounds in 1964. Most of the decrease was in the North and Middle Atlantic areas. This report reviews biological research on the menhaden and discusses landings by area, fishing intensity by area, drop in catch per standard vessel day and total catch, shift of fishing effort to different areas, average age of catch, and estimates of abundance.

THE FOLLOWING MARKET NEWS LEFFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BURBAU OF COMMERCIAL FISHERIES, RM 510, 1815 N. FORT MYER DR., RELINGTON, WA. 22209.

Number

MNL-23 - (Supplement) Fisheries of Chile, 1964, 19 pp. MNL-58 - Republic of Korea's Fishing Industry, 1964,

14 pp. MNL-92 - (Supplement) Danish Salmon Fisheries in Greenland, 1964, 5 pp.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGH LANGUAGE ARTI-CLES ARE AVAILABLE ONLY FROM THE ICHTHYOLIGICAL LABORATORY, BUREAU OF CONNERCIAL FISHERIES, U. S. NATIONAL MUSEUM, MASHINGTON, D. C. 20560.

Preliminary Data on the Work with the Mid-Water Depressor Trawl in the Waters of the Southern Hemisphere, by A. P. Andriashev and U. E. Permitin, 2 pp., Translation No. 35, processed. (Translated from the Russian, Bulletin Soviet Antarctic Expedition, no. 3, 1958, pp. 69-70.)

The Systematic Position of the Black Sea Mackerel (TRACHURUS), by Yu. G. Aleev, Translation No. 34, 15 pp., processed. (Translated from the Russian, Voprosy Ikhtiologii, no. 7, 1956, pp. 174-184.)

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THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

California Fishery Market News Monthly Summary,
Part I - Fishery Products Production and Market
Data, July 1965, 15 pp., (Market News Service, U.S.
Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.) California cannery receipts of tuna and tunalike fish and other species used for can ning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Ari-zona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; prices for fish meal, oil, and solubles; for the month indicated.

California Fishery Market News Monthly Summary,
Part II - Fishing Information, July 1965, 12 pp.,
illus. (U. S. Bureau of Commercial Fisheries, Tuna Resources Laboratory, P. O. Box 271, La Jolla, Calif. 92038.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.

New England Fisheries -- Monthly Summary, June 1965, 22 pp., (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, and Provincetown), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly
Summary--July 1965, 16 pp. (Market News Service,
U. S. Fish and Wildlife Service, 346 Broadway, New York, N. Y. 10013.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

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Fishery Statistics of the United States, 1963, by Charles
H. Lyles, Statistical Digest 57, 524 pp., illus., processed, 1965, \$2.25. As in previous years, this edition of the Statistical Digest contains a review of the overall United States fishing industry; and sections on the fisheries of New England, the Middle Atlantic, Chesapeake, South Atlantic, Gulf, Pacific Coast, Great Lakes, Mississippi River, and Hawaii. This edition also contains a section on the Puerto Rican fisheries. As usual, it gives a statistical review of the fisheries for cod, haddock, halibut, salmon, sardines, mackerel, tuna, menhaden, crab, oyster, shrimp, and otter trawl-caught species. In conclusion, it presents historical fishery statistics, 1873-1963; the statistical procedures used in preparing

the Digest; a pictorial section showing many species of finfish and shellfish; and a list of statistical publications issued by the U. S. Bureau of Commercial Fisheries for 1963. Analysis of the data presented shows that in 1963 the commercial fisheries of the United States yielded a catch of 4.8 billion pounds worth \$377 million to the fishermen. The quantity was 507 million pounds and \$19 million less than in 1962. The average value was 7.78 cents a pound; record landings of flounder, clams, and crabs were made. The total catch was made by 128,470 fishermen operating 11,928 vessels of 5 net tons and over and 66,045 smaller craft.

Guide for Buying Fresh and Frozen Fish and Shellfish, Circular 214, 50 pp., printed, 1965, 25 cents. This pamphlet offers information to help consumers, food buyers, and others associated with the food trades to know more about fish and shellfish. It is a guide to when and where fishery products are available, and describes general market forms, types of containers used, purchasing criteria, and handling and storage techniques for finfish and shellfish.

Articles from Progressive Fish-Culturist, single copy 25 cents:

"Dry concentrates as complete trout foods for growth and egg production," by Arthur M. Phillips and oth-ers, vol. 26, no. 4, 1964, pp. 155-159.

"A method of immobilizing fish for collection of blood or for inoculation," by George Post, vol. 27, no. 1, 1965, p. 48, illus.

"Observations on 'bad eggs' in Columbia River fall chinook salmon," by John F. Conrad, vol. 27, no. 1, 1965, pp. 42-44.

"An underwater camera housing for shallow-water ecological studies," by John J. Poluhowich, vol. 26, no. 4, 1964, pp. 191-193.

"Research on bacterial fish diseases in the Institute of Marine Biology (Argentina)," by David A. Conroy, vol. 27, no. 2, 1965, p. 100.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILD-LIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORNESSONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPE

ACCLIMATIZATION:
"O teorii akklimatizatsii vodnykh zhivotnykh" (Theory of the acclimatization of aquatic animals), by G. L. Shkorbatov, article, Zoologicheski Zhurnal, vol. 43, no. 7, 1964, pp. 953-964, illus., printed in Russian with English summary, Redaktsiia Zoologicheskogo Zhurnala, Podsosenskii per. d.21, Moscow B-64, U.S.S.R.

ALGAE:

Articles from Bulletin of the Japanese Society of Scientific Fisheries, vol. 30. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan:

"Comparative biochemistry of carotenoids in algae. I--On carotenoids in Porphyra tenera K.," by Teru-hisa Katayama, May 1964, pp. 436-439.

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"Fundamental studies on the production of alginic acid. I--Investigation of determination method of alginic acid in brown algae," by Yuzo Harada, Feb. 1964, pp. 141-146.

Nekotorye zakonomernosti kolebanii chislennosti i eliminatsii ikrinok i lichinok Engraulis encrasichol-us ponticus Alex. v usloviyakh Chernogo morya" (Patterns of variation in abundance and mortality of Engraulis encrasicholus ponticus Alex. eggs and larvae in the Black Sea), by T. V. Dekhnik, article, Trudy Sevastopol'skoi Biol. Sta. Akad. Nauk Ukr. SSK., vol. 16, 1963, pp. 340-358, printed in Russian. Four Continent Book Corp., 156 5th Ave., New York, N. Y. 10010.

BERING SEA:

"Nekotorye nauchnye predposylki dlya organizatsii beringovomorskoi nauchno-promyslovoi ekspeditsii" (Some scientific prerequisites for organizing a Bering Sea scientific fishery expedition), by P. A. Moiseev, article, Tr. Vses. Nauch. Issled. Inst. Morskogo Rybn. Khoz. Okeanogr., vol. 48, 1963, pp. 7-12, printed in Russian. Trudy Vsesoyuznogo Nau-chno-Issledovatel'skogo Instituta Morskogo Rybnogo Khoziaistva i Okeanografii, Verkhn. Krasnosel'skaia No. 17, Moscow B-140, U.S.S.R.

BIOCHEMISTRY:

Biochemical changes in catfish, tilapia, and mrigal fish during rigor mortis," by S. S. Pawar and N. G. Magar, article, Journal of Food Science, vol. 30, Jan. -Feb. 1965, pp. 121-125, printed. Institute of Food Technologists, 510-522 N. Hickory St., Chamber 11, 61923 paign, Ill. 61823.

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tion and processing methods are enjoying a greater consumption, but also to take up a more important place in the household diet," states the introduction. The book itself contains lectures presented at the Scheveningen meeting, grouped by subjects: fish preservation at sea (with emphasis on quick-freezing); refrigerated sea water; fish handling (at sea and on shore); cold storage and thawing (with emphasis on hawing problems which are important to the quality of the end-product); port markets -- quality and containers; packaging for retail; and distribution. Concluding remarks point out that "... in the national or international contact which has been established in the technological field between industry and research-workers, the problem of remunerative application deserves the greatest possible attention. An appendix lists the participants at the meeting. This is a comprehensive record of the meeting.

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WEATHER CHARTS:
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Scandinavian Fishing Year-Book, 1964-65 (The European Fishing Handbook), edited by Jørgen Frimodt,

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622 pp., illus., printed, 1965, \$6. Columbia University Press, International Documents Service, 2960 Broadway, New York, N. Y. 10027. The sixth edition of this reference book for people who produce, market, and buy fish has recently been issued, with the importer and exporter sections expanded. Included are sections on foreign representatives, shipbuilders, suppliers of vessels, and processors in Belgium, Denmark, the Farce Islands, Finland, France, Germany, Iceland, Ireland (a new addition), the Netherlands, Norway, Sweden, and the United Kingdom.

There is also a section containing lists of importers and exporters of fishery products in other European countries, Africa, Asia, Australia, New Zealand, the United States, Canada, and Central and South America. A separate part of the yearbook contains a register of fishing vessels in the selected European countries. Features of this edition are statistics on world landings of fish and shellfish, a list of fish terms in different languages, and an article detailing features of the United States-built stern trawler Narragansett.



STUDY LAUNCHED OF ECONOMIC POTENTIALITIES OF CONTINENTAL SHELF

A study of the economic potentialities of the Continental Shelf, a vast 850,000 square miles of largely unexplored and unexploited territory belonging to the United States, has been launched by the U. S. Department of Commerce. The Department's Coast and Geodetic Survey announced June 13, 1965, that it awarded a contract to the Battelle Memorial Institute, Columbus, Ohio, to make "an economic study of the relationship of the scientific survey activities of this agency with respect to the Continental Shelf and their impact on the economic development of the United States." Estimated cost of the 14-week study is \$55,000.

The Coast and Geodetic Survey, as the Nation's chief civilian oceanographic agency, has been conducting, as part of its extensive work in oceanography, limited surveys of the Continental Shelf. The study will include an analysis of this work, of the capabilities of the Agency for enlarging its activities in this area, and of the potential benefits to the American economy if this is done.

Under an international agreement signed last year, the submerged extension of the continent off the Atlantic, Pacific, and Gulf coasts of the United States has been acquired by this country for economic exploitation, the most extensive territory to be added to the country since the Louisiana Purchase in 1803. The agreement provides that United States sovereignty covers "the seabed and subsoil of the submarine areas adjacent to the coast out to a depth of 200 meters," or 656 feet. The agreement further provides that sovereignty will also extend beyond that point to the extent that its natural resources can be exploited by this country.

The Continental Shelf extends from 10 to 300 miles off the American coast, including 175 miles off Cape Cod, from 50 to 125 miles off the South Atlantic states, from 50 to 150 miles into the Gulf of Mexico, from 10 to 50 miles off the Pacific Coast, and approximately 300 miles off the Alaskan coast. The Hawaiian Island's Shelf extends 10 to 50 miles offshore.

While the economic potentialities of the submerged offshore areas of the earth's continents are largely unknown, the exploitation of underwater resources is already under way in various parts of the world. Efforts to extract wealth from beneath the sea include extensive recovery of oil off the shores of the United States; diamond mining off the coast of southwest Africa; iron and coal mining off the Continental Shelf of Japan; tin off the Malaysian Shelf; and the extraction of magnesium and bromine from the sea at Freeport, Tex. Scientists say drilling in depths greater than 200 meters is already feasible.

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ANTIMICROBIAL SUBSTANCES IN CLAMS POSSESS TUMOR-PREVENTIVE ACTIVITY

Paolins, the antimicrobial substances known to be present in sea mollusks, have been found by latest experimental evidence to possess a tumor-preventive activity in addition to their antibacterial and antiviral effects, according to a report by scientists at the National Institutes of Health (NIH), Public Health Service, U. S. Department of Health, Education, and Welfare.

The discovery that extracts from the common clam prevent or delay virus-induced tumors, in hamsters and also inhibit herpes simplex virus in tissue cultures, was reported December 11,1965, by Dr. C. P. Li of the Division of Biologics Standards, NIH, at a meeting of the New York Academy of Sciences in New York City. This investigation was made by Dr. Li, Dr. Benjamin Prescott, Dr. Bernice Eddy, Dr. William Green, and G. Caldes, E. C. Martino, and A. M. Young.

They prepared the extract from fresh clams purchased in August and September 1964, since clams processed during the summer months have been reported to possess more inhibitory activity. The clams were shucked, homogenized, and mixed with an equal amount of ammonium sulphate solution. The supernatant was then dialized and dried, and the resulting tancolor, water-soluble powder was fractionated by column chromatography. Only the major fractions 1, 2, and 3 were used in the study.

Fractions 1 and 2 were administered to baby hamsters inoculated with adenovirus type 12. In one typical experiment, the hamsters were inoculated subcutaneously with the virus. Four days later, daily injections of the clam fractions were given to each infected hamster for two days. Infected, untreated hamsters served as controls. After 90 days, 8 of 11 controls developed tumors. Among two groups of infected hamsters that had been treated with the clam extracts, 3 of 10 and 5 of 10 developed tumors, with the average appearance of the tumors delayed for 13 days in comparison to the control animals.

Experiments for antiviral activity of the clam material against herpes simplex (cold sore) virus were made in primary rabbit kidney cells. The herpes simplex virus was inoculated into cultures immediately after the 3 clam extract fractions were added. After 3 days of incubation, the cytopathic effect in the treated tubes was found to be considerably suppressed with the virus titer reduced by 90 percent as compared to the control tubes.

In discussing the study, Dr. Li pointed out that the antiviral substances isolated from shell-fish material probably belong to or are derived from the glyco- or mucoproteins. In this study, all three fractions gave positive protein and carbohydrate reactions. Paolins are apparently widely distributed in nature; they have been found in plants and in certain animal tissues, as well as in sea mollusks.

"It is possible that the intakeby man or animals of certain foodstuffs rich in paolins plays an important role in the natural defense against certain viral infections," Dr. Li speculated.

BACKGROUND

Meat of the abalone has been a common food item in China for many generations. A familiarity with this sea animal, which has access to a wide variety of organic material of biological origin, led Dr. Li to consider it as a potentially valuable source of material in which to search for an antimicrobial agent. His work with the abalone, first reported in 1960, showed that commercial canned abalone juice given orally to mice possessed an inhibitory effect against intraspinal infection of types 1 and 3 poliovirus. He also found that crude fresh abalone juice possessed marked inhibitory effect against Staphylococcus aureus. Subsequent work at NIH has been done with Dr. Benjamin Prescott, of the National Institute of Allergy and Infectious Diseases,

(Continued on next page.)

Dr. Li then screened a number of sea animals for antimicrobial activity against S. aureus, and found that extract of oysters and clams also possessed marked antimicrobial effects,

The next step was the isolation of several fractions from abalone juice by ion exchange chromatography and the discovery that one active fraction was bactericidal, and another fraction was found to be rich in antiviral substance. Dr. Li named the antibacterial substance Paolin 1 and the antiviral substance Paolin 2, from the Chinese word paolin, meaning abalone.

Dr. Li and his associates then switched their attention to the oyster and obtained a substance that possessed both antibacterial and antiviral properties. They found it protected against Streptococcus pyogenes infection in mice. The protective effect was much the same against type 1 poliovirus, reducing the paralytic rate from 70 to 40 percent. When mice were fed this substance 24 hours after infection with influenza B virus the death rate from influenza was reduced from 70 to 50 percent.

Although the work of Dr. Li and his associates has been primarily concerned with antiviral substances in sea foods, they have also successfully demonstrated these substances in plant and animal tissue (snow peas and calf thymus). The antiviral agents in these hosts were separated by extraction with either acetic acid or water, and by chromatography.

These antiviral substances are probably representative of a large group of substances occurring in nature in similar or related forms. Thus far, their existence can be detected only by antiviral assay in vitro and in other living organisms.

The mode of action of these substances is unknown. They do not seem to inactivate viruses, nor to prevent the virus from being adsorbed to or penetrating into susceptible cells. They appear to interfere with the replicating process of the virus within the cell.



GULF STREAM TO BE SURVEYED BY OCEANOGRAPHIC SCIENTISTS

The Gulf Stream, which flows like a river 40 miles wide and 2,000 feet deep through the Atlantic Ocean, was closely surveyed by scientists during summer 1965.

By understanding more of the forces and patterns of that vast ocean river, scientists will be able to come closer to predicting adjacent changes in the weather and fishing conditions, said the chief oceanographer of the Coast and Geodetic Survey, U. S. Department of Commerce.

The oceanographic program was slated to get under way in July. Scientists participating in the program were to be from the Coast and Geodetic Survey; U. S. Weather Bureau; the Massachusetts Institute of Technology, Cambridge; Woods Hole Oceanographic Institution, Woods Hole, Mass.; University of Rhode Island, Kingston; Lamont Geological Observatory of Columbia University; and the University of Miami. (Science News Letter, April 24, 1965.)

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HIGHLIGHTS IN THIS ISSUE (NOVEMBER 1965)

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SHRIMP POTENTIAL OF THE EASTERN GULF OF GUINEA-Two main species of commercial importance (p. 9).

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DENMARK--Develops lightest fiber for fishing gear (p. 56).

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JAPAN--Trends in major fisheries--tuna, salmon, crab, shrimp, trout, and mackerel (pp. 60-65); fisheries agency requested to study international fishery problems (p. 67).

MEXICO -- Shrimp exports to Europe and Asia granted tax advantage (p. 68).

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Plus

Market reports; new vessels and new products; fishery news from 14 other countries; Congressional actions affecting fisheries; reviews and listings of recent fisheries publications throughout the world.

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